RURAL INDIA

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" Salvation of India lies in Cottages. "

—*MAHATMA GANDHI*

TWENTY YEARS

WITH the present issue, 'Rural India' completes twenty years of its publication in the pioneering enterprise of rural journalism and the development of rural life and conditions in the country.

Eversince it was started in November 1938—now twenty years–Rural India has persistently maintained to role of 'Missionary Journalism' which has practically become extinct in this country after Independence. In the Era of power-politics and personal profit that started in the post-independence period, Rural and National Reconstruction have lost their pre–independence character and became instruments of propaganda and securing of votes to the ruling party. The two successive plans and the schemes of Community Projects and National Extension Services have been made use of by the clever Congress politicians as effective devices of raising hopes of the electorates to win elections and to get into power. For all practical purposes, Planning in this country has served a definite political objective of consolidating the Congress position in areas covered by various development schemes.

It is largely political consideration that weighs with the authorities in the selection of the areas for starting Community Projects and National Extension Blocks. Money disbursed under these schemes has the primary objective of consolidating the Congress position and creating favourable field for the Congress candidates to secure easy votes. The net–work of Village Panchayats and Co-operative Institutions are likewise tainted by the same political and party considerations. Even in the matter of giving Government grant or subsidy to public or private institutions, political and party considerations stand supreme with the present ruling authorities. It is no wonder, with an outlook so vitiated by the party considerations, enormous public funds that have been spent in the name of development have, in fact, gone to serve the ends of party consolidation. And, as a consequence, in place of much talked out development and economic prosperity of the people, the country witnesses the depressing scene of universal demoralisation, frustration, mounting burden of national debts and a feeling of 'National Failure' in the twelveth year of the Congress regime.

Feeling of 'National Failure'

What one witnesses in the country today is not merely the failure of the administration or the top–most leadership, but a sense of feeling of national failure to achieve anything worthwhile, after we have attained Independence. Rather than an upward trend in spheres pertaining to national development, there has been precipitate decline and a downward trend continues unchecked. The people as a whole are seething with discontent and have lost faith in the present leadership to deliver the goods. The situation, as it has developed in the country as a result of wrong leadership and wrong policies pursued by the administration all these years, is more or less dismal and does not appear to be within the competence of anybody to put it aright. A big political change–call it revolution if you like–in the affairs of the nation is, therefore, both inevitable and imminent.

Ominous Portents

The failure of the Parliamentary Democracy in most parts of West Asia and the establishment of Military Dictatorships in the neighbouring countries of Pakistan,

Burma and Thailand definitely point the way of the political change most likely to take place in the affairs of this country in the near future. The symptoms of the desease in our body politic being more or less similar to those obtaining in the neighbouring countries which necessitated major operation, it is no use sitting back and deluding oneself into the mistaken belief that India is different.

If, at all, India is different from its neighbouring countries, as the Congress leaders want us believe, the difference is merely of the degrees in the stage of development of the desease and not the absence of it, as is presumed by them. Since the desease persists, in spite of the treatment administered by the leaders, endangering the health of the Nation, the necessity of drastic treatment by Nature cannot be ruled out. And, in the prophetic words of Shri Rajaji, "*If an efficient administration should fail....it would not be a military force that would replace the civil Government in India, but the whole country would be split by communal conflicts*'.

These are prophetic words of India's living 'Chanakya' with us conveying shadows of the coming events, which, it would be wisdom and statesmanship on the part of the Congress leadership to pay serious heed in time before it is too late.

IDEOLOGY AND FOOD CRISIS

By : **M. A. VENKATARAO**

A GLANCE at the examples of successful farming in the free world will reveal in a dramatic way the bright road of development that agricultural experts and Government policies in the pre-planning period have been pointing out for emulation by our country. The scientific part of the example remains but a new factor has been introduced by the ideology embedded in the Planning Commission's blue print and that is responsible to a greater extent than anything else for the present anxious stalemate in food production and the crisis in agricultural development generally.

A Canadian Farm

Mr. Satwant Singh reminds us of the reasons why Canadian Farming is successful in a brief but telling article in the Issue of Indian Farming for May 1958.

He visited the dairy farm that one Ryan owns near Ottawa. It was spread over 221 acres and had a livestock population of 70 Holstein cows, 33 calves and 123 sheep in addition to 12 horses.

It will be seen that the extent of the farm is only 221 acres, neither too large nor too small. Indian agriculturists and experienced land-owners have been urging States Government reformers in recent months to give up the idea of fixing low ceilings around 30 standard acres but agree to allow units of around 200 acres. Mrs. Malle Gowda in her book: Whither Rural India? has pleaded for 200 acres of wet land or 365 acres of dry land as reasonable for rural careers *vis a vis* urban professions.

It is learnt that contrary to the usual impression that even in the United States of America, the average holding is around 280 acres, though the largest farms are very much larger being above 1000 acres. But the large majority have around 280 acres. They range from 170 to 280 acres.

It is clear that 200–300 acres are sufficient to enable scientific methods and capital to be applied in a fruitful way yielding optimum results. Sri Meher Chand Mahajan also indicated ceilings around 200–300 as tolerable. In a more recent article (vide Hindustan times, 3rd September 1958) he has suggested the establishment of farms of 250 acres to be owned by the State but operated by experienced, successful farmers in partnership with the State. Another suggestion of his is the leasing out of virgin lands in units of 250 acres each to enterprising agriculturists for long periods such as 30 years.

Thus it is the considered opinion of knowledgeable people–experts and experienced farmers–that the present ideas of

land ceilings prevalent among legislators in the Southern States and already embodied in law in most Northern States are uneconomic from the standpoint of scientific methods and maximum levels of production.

Apart from the moderate extent of the Canadian dairy farm visited by Mr. Satwant Singh, there is another aspect that attracted his attention. It was the question of labour. There were only six farmhands for all the varied and strenuous work on the farm. But they were graduates and diploma holders in agriculture unlike our labourers in villages. They aimed at purchasing their own farms after saving the capital necessary for it. They are paid well enough for such savings to be possible. They were given bonus and percentage commission on milk receipts and sales of livestock. They were given free board and lodging and half the medical insurance and premium on accident insurance. Each farmhand earns 3000 dollars per year half of which is saved for purchase of farms of their own. They become independent farmers with full experience of farm work and modern methods. The Ryan farm itself was purchased for $ 25,000 many years ago and is now worth about $ 1.21,000. The point to note here is that wage-earners here were not demoralised to expect *free lands* from their master's holdings. Nor were the owner demoralised with the prospect of having to surrender the bulk of his lands for a song. Ideology did not hamstring their incentives and bring despair and stalemate in its train, as it is being done in our country today.

Mr. Singh describes how the administration in Canada distributes pure seed and sees to it that it is actually used on the farm by efficient extension work. If the seeds prove bad, the farmer is given compensation !

Rural finance is the third factor that Mr. Singh noticed as contributing to the success of the farm. This is furnished in the classic way of Denmark through rural co-operatives run by farmers themselves independently of Government. Loans are given for grading, storing, drying, processing or marketing of farm produce as well as for carrying out improvements or for purchasing farm equipment.

All these methods of better farming are quite well-known to Indian experts and leading farmers. But the snag lies in inefficient administration and uneconomic holdings. To these long standing defects, we have now the devastating effects of a grim ideology striking at the root of free enterprise in agriculture and seeking to reconstruct social and property relations in the countryside on the basis of socialism.

The Danish Example

Denmark is the classic land of agricultural progress and a visit by Mr. J. C. Dhar to that country is described in *Indian Farming* for April 1958, that reinforces the lessons drawn by Mr. Singh from his visit to the Canadian Farm. Our Prime Minister himself visited Denmark last year and saw flourishing farms and co-operatives and scientific methods used in them in an up-to-date way. Denmark is famous for building a small farmer economy on the basis of private ownership, redistributing land holdings without the destructive Communist slogans of "land to the landless and land to the tiller". Nobody was encouraged to hope for *something for nothing* in Denmark. Lands were not confiscated from rich owners and given for next to nothing to the landless people irrespective of character and capacity to make good. Nor was the vote of the poor made the sole objective of the legislators riding roughshod over all other factors of human psychology and economic wisdom.

Mr. Dhar points out that Denmark has no raw materials like petrol, coal, iron etc. and has to import all her needs. The only raw material she has is the soil and this soil produces 66 percent of all her exports. Farming in Denmark is a paying business. A farmer having 25 acres or more of land is rich, owns a motor car and maintains a high standard of living.

The right road to such a consummation in India would surely lie in the direction of lessening the extent of holdings-not immediately-but after and as the level of efficiency rises, when large holders may sell off parts of their holdings to smaller farmers and use the purchase money for improving the lands retained.

Mr. Dhar worked during his study tour on a 1000 acre farm for three months. The big farm was managed *only by 15 workers* which was possible on account of mechanisation.

Mr. Dhar attributes much of the success of the farm like Mr. Singh in respect of the Canadian farm, to quality control of the seed distributed to farmers.

If the crop fails on account of defective seed, the farmer receives compensation. Also, insurance is fully made use of in respect of livestock, poultry and everything on the farm. Insurance is not annexed to the State.

Cost is lowered and profit margins increased by consolidation of holdings and large scale mechanisation. Co-operative organisations of all kinds are fully availed of for purchase of farmer's needs and equipment as well as for credit and marketing. The advantages of large scale operations are thus made available to the peasant without depriving him of his property rights and individual freedom of work and management.

Another characteristic of Danish farms is their *mixed farming* and balanced economy. 98% of Danish farms are mixed farms producing a variety of products—grain and fodder, milk and butter, eggs and bacon. The level of income and standards of living in the rural areas of Denmark are comparable to those of skilled workers and foremen in modern Western factories, even if we take small holders *into account.*

American progress

In the United States there has been a veritable revolution in the last 20 years. Here agriculture has increased its total production four-fold in this period. Per acre increase of crops has been striking in all fields, productivity has increased phenomenally. The wages and amenities of agricultural labourers have naturally registered corresponding and unheard of levels of increase. The pressure on the land has been relieved to an astonishing extent owing to mechanisation and improved seeds and other technological improvements. Only 13 percent of the population now produce the entire food and other agricultural products far exceeding the needs of the home market. So much so, the Government has taken from the days of the New Deal and the second world war to a policy of enormous farm product support in prices to maintain the profit margins of farmers, while curtailing production.

Today more than 80 percent of farmers are said to desire a discontinuation of the policy with return to the free market. Anyway, the lesson for us is that a judicious assistance by the State to regulated enterprise in farming is capable of a steady and progressive increase in food and other agricultural materials in a measurable period, thus solving the food problem for our growing population once for all and enabling our farmers to step up production *pari passu* with increasing population in the years to come.

Here are three clear and persuasive examples for us to follow; examples of agricultural progress without upsetting social relations and property rights and damaging incentive and drying up the fountains of capital investment in the countryside.

Our Agricultural Situation

What has prevented India from following this well-trodden path towards agricultural prosperity? Even from British days, agriculture has been receiving signal attention at the hands of the administration, the new agricultural departments with trained experts and administrators at their head initiating experimental stations and assimilating and teaching the lessons of the latest developments in agriculture in Europe and America.

We have had a vast effort under the name of the "Grow More Food" campaign from the days of the war spending dozens of crores every year for speeding up the production of food alone, throwing open new lands for cultivation on easy terms, giving vast quantities of fertilisers and making arrangements for the distribution of the pure seeds, granting vast sums of money in loans and advances and creating a vast new staff to put the scheme across to the cultivator.

After independence the work has been stepped up especially from the inaugura-

tion of the First Five Year Plan in 1951. It was proclaimed from tbe house-tops in 1952–53 that the country had achieved self-sufficiency and that there was no anxiety any more. No doubt production was on the whole increased but in 1957–58 we are back again in the throes of scarcity with larger deficits in food grains than ever before ! If we had to import Rs. 100 crores worth of food grains in earlier years after the war, today we find that five hundred crores worth are needed in the rest of the Second Five Year Plan period ! What is the debacle due to ?

We have to bear in mind that we are having in the latest period from 1953 a vast network of Community Development Projects operating on groups of villages taking the benefits of modern technology to villagers and stirring them up to take advantage of modern facilities to modernise their ways of life and work with the help of the New National Extension Department. By now half the number of villages in the entire countryside are said to have been covered by these organisations. Latterly they have been alerted to stress the increase of production and give it the pride of place in their programmes of village development. Vast sums have been spent. But we have today the paradox of scarcity and deficit production confronting us in the field of food grains.

Lacuna in Administration

One reason that has contributed to this colossal failure is, of course, the failure of the administrative machinery to reach and influence the actual cultivator.

There has been a lack of coordination between the different departments of the Central administration in their impact on the cultivator and in the relations between the Centre and the States, for power is divided between the two, the actual administration being part of the States machinery while the directing overall agency has been the Centre. Economic and Social planning is concurrent subject while agriculture belongs to the States sphere according to our Union Constitution.

Also, the problem of agricultural production is a long standing one in our country with its features of subsistence farming, inadequate holdings, impoverished farmers, ignorant landowners and disorganised economy in the countryside and uneconomic holdings. Finance and know–how have both been largely lacking for most of the cultivators in the vast countryside.

Shock treatment and short term facilities such as those offered in the mush–room "Grow More Food" campaigns on *ad hoc* basis did not take effective hold of the people and assure them an effective new basis of work and motivation. The peasant was not persuaded to take to new ways on a permanent basis as part of his life-plan.

Short term campaigns were not woven into integral parts of a permanent policy operating continuously eliciting the intelligent consent of the peasant and harnessing his potentialities for capital investment.

But the basic structure of agriculture namely uneconomic holdings and ignorance of modern know-how were not taken hold of for radical and firm treatment. The superstructure was not built on a new foundation. As for the grain coming to the market, the lack of the peasant's power to withhold his harvest from the market for a while for sale at convenient moments put the grain stocks into the hands of middlemen with all their proclivities to hoard and exact high prices from the public later in the season.

Many discerning administrators have noted this mal-adjustment between administration, cultivator's needs and the behaviour of the marketing class of middlemen.

The ancient system of maintaining stocks of grain sufficient for a year in each local centre by Governments and the custom of taking revenue in kind have long been in abeyance since the days of the British regime. The old system is in ruins and a modern one has not yet been built up in its place. The situation is aggravated by modern rates of increase in population at 4 to 5 millions a year.

Ideology

There is a large element of truth, no doubt, in this answer from the administrative angle.

But on the whole a much more influential factor that has been responsible for the present food crisis is the *ideological factor* imported into the situation from the first days of the advent of independence. Among the first major operations of the new swaraj Government of the Gandhian Congress was to repudiate Gandhism and take measures to abolish the zamindari in revolutionary ways i. e. with nominal compensation and promises of land to the tiller. Lakhs of zamindars, most of whom were but landlords with middle class incomes were dispossessed in 1948–49. Before the country could assimilate the new climate of rights and achieve a working acquaintance with new conditions of democracy, the slogans of "land to the tiller" rent the air. The Communist party invaded the countryside and sowed the seeds of social conflict and aroused greed and hopes of "land for nothing" in the minds of tenants and small holders.

The Report of the Congress Agrarian Committee puts these new aspirations into shape. We find that already in 1949 the Socialist Pattern of Society in the matter of land reforms stated in black and white as if they were the only ways in which agricultural relations could be reconstructed without an alternative. The constructive ways followed in Britain during the war, in the USA during the last 20 years with such astonishing success, the Danish method of redistributing land and modernising cultivation were all ignored. The band of agricultural experts in departments and colleges of agriculture and the Indian Planters of tea, coffee, and rubber who had assimilated modern methods from British exemplars in Assam, Mysore. Travancore, Coorg and Madras were all ignored.

The Congress ideologists took the field and won the confidence of Pandit Jawaharlal Nehru and laid down the lines of a Leftist blue-print even before the Report of the First Five Year Plan. Indian peasants and agriculturists were bypassed and their case went by default. The ways of the free scientific West grafted on individual freedom and independent personality were barred for adoption in India by this band of ideologists with Nehru at their head. The other way of Moscow and Peking was kept open and land reforms came to mean in Indian discussion nothing but an imitation of Soviet methods of confiscation of property and liquidation of peasantry small and big and collectivisation. The unceremonious way in which the large class of zamindars was dispossessed in the North, Orissa, Madras, Rajasthan and Madhya Pradesh with Government paper of 20 years' duration struck a chill in the hearts of land-owners all over the country. The first part of the proposed reforms fixing low rents and conferring security of tenure to tenants in many States was put through easily enough in the last few years. But the new notions of robbing the land-owner and transferring the ownership to the tenant working on lands, and of granting new lands to the landless, robbing if necessary, further slices of land above a ceiling for the purpose introduced a *profound misgiving* in the field of agriculture.

The post-zamindari era and the era of the Five Year Plans have thus been characterised by a deep unsettlement and uncertainty and agrarian unrest in the entire rural areas of the country. This climate of unrest and doubt as regards the shape of the future has dissolved the fundamental bases of understanding between labourer, tenant and land-owner coming from ancient days and *is more responsible for the fall in production in* spite of assistance and advice offered by the Government agencies on an unheard of scale in the last few years.

The Tenants have contented themselves with producing enough corn for their own needs and grew as much of commercial crops as possible tobacco, oilseeds, cotton for better returns in the time of high prices that have prevailed with scarcely a let-up from the days of the war. In most countries in the West, wartime prices were reduced drastically with inflation confined to fifty percent at the most. But in India, the country has been forced to make a peace-time economy on the foundation of a *fourfold*

inflation. The middle class is being wiped out with a new class coming in its place slowly out of the vast new development expenditures and proliferation of the bureaucracy tenfold and more. We have had a field day for destuctive slogans and leftist reformers and swollen-headed journalists mouthing without realisation the newest slogans from Moscow and Peking.

Land Reforms and their Effect

The Congress Agrarian Reforms Committee laid down the new pattern of land ownership by peasants abolishing the property of land-owners as early as 1949.

"Land should be held for use and the cultivator should have permanent and heritable right of cultivation in land. We define the cultivator as one who puts in a certain amount of manual labour in cultivation"

Two points are worth noticing in this sweeping abolition of the rights of the land-owners as a class who are put on the same footing as zamindars who got their rights by gift from former governments and whose status was that of farmers of revenue or collecting agents paying a fixed revenue to Government.

The land-owing class is abolished at one stroke. The cultivator or kisan or peasant is defined as one who labours on the land-a communist class definition of the peasant according to which the proletariat is to be the new class on whose behalf the Socialist-communist society is to be built.

Land-owners should have challenged this ideology from the very beginning. It is rather late in the day for releasing the people and the entire body of legislators from being unswayed by it.

This climate of thought obtained authoritative status in the Planning Commission Report I and is finalised in the Report II of 1956. It is formulated in the Kerala Agrarian Relations Bill and the Andhra ceilings Bill and forms the substance of the Reforms Committee Reports in Mysore.

The period of hesitation and silent opposition on the part of the Congress rank and file and legislators since the First Plan has come to a close with the directions of the Congress High Command to State Party Committees and Governments to enact the socialist programme of "land to the tiller" and to the landless" on the basis of a liquidation of land-owner's rights on the analogy of the zamindari rights without further delay. Congress land-owners have mostly sold off their lands in the interval and reinvested their capital in urban properties fetching high and secure rents. Many have divided their holdings among children and other heirs before the date-line fixed for freezing rights in land. Now they hope to get their lands above the ceilings, saved as much as possible, on the ground of numbers exceeding five in the joint family. But *no frontal opposition on the ground of principle* dictated by a different and more constructive vision of development has been forthcoming from the Congress circles. They will sacrifice the country for their personal interests. *Thus a vacuum in ideology is filled by a worse ideology.* The men of wisdom *who refuse to fight wrong theories* have to suffer from wrong ones themselves as well as the people in general.

Communist Ideology And Practice

A glance at Communist authorities will reveal how closely our present land reforms scheme follows their exemplars in Russia and China.

Stalin points out in his Foundation of Leninism that Lenin was not interested in the peasant problem merely for the sake of the peasant and his progress. His interest was on the contrary sprang from the value of the peasant as an ally of the proletariat. His interest was primarily to transfer the peasant class in the countryside from being the reserve of the bourgeois to become the reserve of the proletariat in their struggle for power.

Stalin also points put that according to Lenin the right way to use the peasants is to rally the poorest peasants first on the side of the proletariat with the middle peasant as an ally for liquidating the rich peasants, later liquidate the middle peasant too and organise the small peasant and the landless in co-operatives. Such co-operatives are to be the pathways

to the construction of Socialism in which both industry and agriculture will be in the hands of the State with all private property as the means of production completely swept away.

Mao Tse tung too follows this method closely. He follows the division of the peasantry made by Marx and Lenin into the property landlord, rich peasant, middle peasant, poor peasant and the landless agricultural labourer.

(See Chapters on Chinese Revolution and New Democracy in Selected Works of Mao Tse tung Volume III People's Publishing House Ltd. Bombay 1954)

Such classification is made to help Communists to divide the peasantry and conquer the different groups one by one each higher group with the help of the lower group.

Today in India, Congress has adopted the same strategy or tactics. The Congress Journal of the AICC called Economic Review repeated this classfication in its issues for May and June 1956 to assist the Congress cadres to carry on the campaign for the liquidation of the landowning class not by argument and non-violent persuasion but by mobilising the hatred and greed of the poorer classes of peasants against the richer groups.

In this light, the section on land reforms in Planning Commission Reports I and II assume their true importance. This aspect of Congress imitation of Communist strategy and technique in abolishing the propertied classes in the countryside so that they can have the full and hate-filled support of the poorest peasants has not been sufficiently noticed by the thinking people.

The Planning Commission Reports

"The interests involved are : 1. intermediaries, 2. large owners 3. small and middle owners 4. tenants-at-will 5. landless workers, Any action affecting one interest must necessarily give something to or take something from the others. As social and economic adjustments are made, a new social order will take the place of the old." (Report I Chapter xii page 88 Popular edition.)

Intermediaries are referred to in this context as if there were no difference between zamindaris and ordinary landowners who have acquired their rights in the open market by right of purchase.

The idea of an upper limit on land holdings is thought of to liquidate the rich landlords. The tenants and landless i. e. the poor farmers and landless will support the reformers as against the middle and rich landlords. Class war is coolly assumed and mobilised. This is pure Communism, except for actual violence. But there is sufficient violence in the mind and disposition and actual attitude. The numerous murders that have become the order of the day in the rural areas after these ideas were sown there by politicians, Congress and Communist provide evidence of the violence unleashed. We find foot-prints of this today in the whole State of Kerala in particular.

The Total Effect on Production

Steady production requires as a psychological condition precedent the feeling and assurance that one's hard work on the land will be rewarded with the produce in some agreed share as between landlord and tenant. If this confidence is tampered with, the peasants will have no heart to work and work for a surplus. Tenants have been promised ownership at little cost. So they are refusing to pay even the old rents to their owners. They refuse to leave the land either egged on by politicians who oppose their eviction. Already even before legislation peasants refused to leave or to pay rents. The property rights of owners are already gone in most areas. The tenant will naturally produce cash crops as much as possible if he has the resources. If his landlord under present circumstances refuses to help with money for improvements or fertilizers etc. the tenant produces enough food crops for himself and refuses to produce a surplus for the market. The Government does not know with whom to deal till the question is cleared up by legislation. Capital for improvement is not going into land as before.

Incentive for all on the land has suffered eclipse on account of the socialist or liquidatory reforms proclaimed in the

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POPULATION AND FOOD SUPPLY

By: **S. P. SINHA**

INDIA'S population at present is near about 400 millions. If we assume the lowest minimum intake of calories to be 1,400 ; we are in a position to feed less than 300 million people. Thus ¼ of our population is either starving or is on the brink of starvation. Thus people in India face acute hunger in times of famines ; while in normal times their food is seldom adequate in quantity and never in quality. In this context one would wonder what India's Five Year Plans propose to do for bringing about an adjustment between food supply and growing population.

The Five Year Plans make a two pronged attack on this problem. Firstly they aim at slowing down the rate of population growth. Secondly, they aim at revitalising and reorganising subsistence agriculture by introducing institutional changes on the agricultural front and by raising the development potential of the agricultural sector. But the underdeveloped nature of the Indian economy presents a series of obstacles in the way of economic progress, where population planning works slowly and yields moderate results. This difficulty is further aggravated on account of the conservative, illiterate and traditional nature of our people. Careful population planning and resource development is an urgent necessity for solving our problem.

India is predominantly an agricultural country. Its average income is just enough to feed 2 men in every 3 of the population. This is due to an "imbalance between agriculture and industry. At the time of the commencement of the first Five Year Plan 70% of the population depended on agriculture, 1% were engaged in organised industries, and 5% obtained their living from small-scale industries, including cottage and handicraft types. Since then this imbalance is being slowly removed by developmental planning. The first Five Year Plan laid more emphasis on increasing the per capita production of land by the introduction of better and improved methods of cultivation. The second plan aims at an all-out-programme of large scale industrialization which might reduce the pressure of population on land and improve the living conditions of the masses.

In India if we look to the rate of increase in population and the expansion or development in agriculture during the past few decades the magnitude of the real problem can be assessed.

The following table gives the percent variation in population :

Table 1

Year percentage increase or decrease (±) in population.

1911	+ 6·1
1921	+ 0·9
1931	+10·6
1941	+15·0
1951	+12·3

The table shows that the population has been constantly increasing during the years 1911 to 1951 while the percapita acreage under cultivation and under food grains do not reveal the same tendency.

Table 2

per capita acreage under cultivation.

Average of years.	Area under cultivation	Net Area sown.	Area under food grains.
1910–14	1.9	·8	·7
1920–24	1·11	·9	·8
1930–34	1·4	·9	·8
1940–44	·9	·7	·6
1950–54	·4	·8	·7

On the other hand the table reveals that there has been a decline in the per capita area under cultivation, area sown and area under food grains indicating an increasing pressure of population on land.

Similarly, the trends in production show that the per capita production of food grains has been decreasing between 1910–50.

Table 3

per capita supply of food

(in lbs)

Average of years	Production of cereals	Net supply of cereals
1910–14	344	299
1920–24	385	337
1930–34	370	324
1940–44	290	254
1950–54	301	266

The table reveals that both the per capita production as well as the net available supply have registered declining trends. This again suggests the growing pressure of population on food resources. While the factors determining the rate of growth of population indicate greater potential of increasing population in future.

The two determinants of the growth of population namely the birth and death rates have in recent years been undergoing changes due to many social and economic factors. There has been steep downward trend in death rate due to improvements in medical aids, sanitation and public health programmes and increase in incomes. But the birth rate has not shown any remarkable change. This means that in future, unless birth rate is controlled, population is likely to increase at a faster rate. Thus the trends of births and deaths indicate that the population may increase in the next three decades at higher rate than that of the past years. The Second Five Year Plan has assumed a rate of growth of 12.5% population for the decade 1951–60, while, on the basis of the birth and death rates obtained by means of a sample census conducted by the Registrar General in 1952–54, all over India, the annual rate of natural increase turns out to be 1.5%. It is presumed that the population has increased at this rate during the quinquennium 1951–56. Not only this, some experts are of opinion that it may grow at a faster rate than this during the next quinquennium 1956–61 due to a further decline in mortality and increase in income. According to them the crude death rate during this period may be lower by about 5 per thousand in comparision to the first quinquennium. On this basis we may have to allow for a population increase at the rate of 2·0% per annum during the period of the second plan as suggested by the Food-grains Enquiry Committee.

On the basis of these suggested rates of increase in the population for future, it may be possible to project the future population in India in the following order.

Table 4

Future Projections of population in India.

(in millions)

Basis (rate of increase)	1961	1971	1981	1991
Planning Commission	408	465	530	
Registrar-General of India	419	487	565	656
Food-grains Enquiry Committee	476	627	826	1088

Even if the rate of increase at 2% per annum as suggested by Food-grains Enquiry Committee may seem a very

high rate, the most moderate estimation on the basis of 1·5% annual increase in our population as suggested by the Registrar General is a matter of great concern. The figures indicate that in future there is likely to be a greater demand on food resources.

On the other hand supply of foodgrains does not show the same increasing tendency. Supply is mostly affected by domestic production and imports. The present or future supply position depends upon the expected behaviour of these two.

The domestic production depends upon the extension of area under cultivation, increasing the yield per acre and maintaining stability in production from year to year. As reported by the Planning Commission, "inspite of the increasing of population, very little extension of cultivation to waste lands has taken place during the last 40 years" (a) This seems to indicate that the available cultivable waste does not seem to be within the reach of the cultivators. Moreover, the area to be brought under cultivation by reclamation is so small in comparison to the total cultivation area that it may not make any significant difference in the per capita acreage under cultivation.

Similarly, the yield trends indicate large variation in the yield of foodgrains from year to year. The per acre yield of rice and wheat over a period of 40 years show declining trends. Largest variations are observed in dry crops like Jowar, Bajra and Maize, grown in dry zones which depend upon rainfall and in rice which again depend upon monsoon rains. Lack of irrigation. manure and better variety of seeds have been responsibfe for large variation in yields per acre from year to year and in lower returns per acre.

Similarly, the year to year variation in production of cereals indicate a great amount of instability in the supply of cereals. Table 5 indicates the mean percentage changes from one year to the next in the production of important foodgrains in India.

Table 5

(1914–54)

Mean - percentage changes of foodgrains in India.

Foodgrains		Mean-percent changes.
Rice	—	24.7
Wheat	—	9.0
Jowar	—	2.7
Bajra	—	4.1
Maize	—	2.8
Barley	—	2.1
Graun	—	6.8

(a) Planning Commission—The First Five Year Plan 1952, Page 155.

The table suggests that the greatest amount of instability in production lies in two most important cereals namely rice and wheat which form the main diet of the people. Thus there is need for introducing stability in production and increasing the yield per acre, without which the food supply can neither be improved nor made stable.

On the other hand, the conditions affecting import of food are most strained due to difficulties of procuring dollar to finance imports from foreign countries. Thus food supply in future will have to depend mostly upon internal resources.

Recently, the task of improving the food supply has been undertaken under the Five Year Plans. The second Plan originaily provided for 15% (10 million ton) increase in the production of food grains. Subsequently this was increased to 23.8% (15.5 million ton). But there is every doubt that this target may not be achieved due to administrative diffi-

culties or unsympathetic behaviour of the monsoons. Thus the future supply has to be estimated in the neighbourhood of 60% of the targets laid down, indicating conditions of a short supply.

Moreover, the experience of the first Five Year Plan shows that much of the increase in production was more on account of favourable monsoons than of agricultural planning. Therefore, this shortage has to be removed by intensive efforts because in recent years the foreign exchange difficulties have cut down all prospects of filling the gap by foreign imports. The rapidly developing industrial sector (as assumed by the second Five Year Plan) cannot thrive unless production of food and raw materials is substantially enhanced. But this aspect has been neglected in the Second Five Year Plan. The following figures showing the percent outlay distribution of the first and the second plans will make the points more clear:

Items	First Five Year Plan Percent of the total outlay	Second Five Year Plan Percent of the total outlay
Agriculture and Community Development	41.5	31.3
Irrigation & power	56.2	38.0
Industry & Mining	15.2	37.0
Transport and Communication	47.2	57.8
Social Services	45.2	39.4
Miscellaneous	3.0	2.1

These figures show that adequate emphasis has not been placed on agriculture, irrigation and power. However, there is need for conscious effort to bring about an adjustment between population and food supply.

The adjustment can be brought about in two ways. Firstly, comprehensive type of population control policy should be adopted. The propagation of Family Planning among illiterate, rural people requires huge expenditure. But this is not a wastage. It was in the first plan that Family Planning was inaugurated for the first time but the provision of Rs. 65 lakhs was too small an amount for this purpose. However, Committees were appointed, pilot centres were opened, propaganda was made to popularise family planning.

It is in the second plan that a great spur has been provided by making a provision of Rs. 5 crores for this purpose. It is expected that about 300 urban and 2,000 rural clinics will be set up during this period. This is expected to provide at least one clinic for every fifty thousand population in the major towns and big cities. But even a 5 crore expenditure is not enough to spread the idea of planned parenthood.

Moreover, the second plan is likely to usher in a "population explosive" period with lower death rate without corresponding reduction in the birth rate. Thus a reorientation of the National Population Policy in the following direction is needed i. e. planning should be undertaken both for existing and future population; a population planning commission should be set up; States should step up their programmes for setting up family planning clinics and social, adult education programmes should be intensified.

Secondly, the domestic production of food grains should be increased. At present there is great shortage of rice in the world market. The most important rice exporting countries upon whom we depend for our imports, are Burma and U. S. A. As far as U. S. A. is concerned, exchange difficulties are there. Thus there is complete dependence upon Burma for our imports which is not a very happy phenomena because produc-

tion of rice in Burma, primarily depends upon monsoon and there are more than one rice-importing countries in the world today. As far as wheat is concerued U. S. A. and Australia are the main suppliers. Here again, exchange difficulties are proving a great handicap to our food sufficiency. However, import of wheat is more easier than that of rice.

Thus the only hope consists in increasing domestic production. But the increase in internal production depends on availability of new land for cultivation, possibilities of increasing per capita yield. In most of the States there is no possibility of expanding cultivation. Therefore, reliance has to be made on intensive development of agricuiture.

The Second Five Year Plan has not given the same importance to agricultural development as was done in the First Five Year Plan probably because the planners were misguided by increased production during the first plan and the fall in prices of Agricultural goods at the time of planning expenditure for the second plan.

Thus here again, there is need for reorientation of the policy and intensification of all such schemes that may lead to intensive cultivation. Along with this the price-policy with regard to agricultural commodities is to be a conscious, deliberate and active price-policy. The crop insurance scheme has got to be tried and institutionalised. The Community Development projects and National Extension Services are to be revitalised by encouraging people's co-operation. The food habits of the people are to be made more flexible and uniform by propaganda and persuasion. Above all co-operative farming is to be tried wherever possible under existing circumstances.

Thus by a judicious integration of the two, the population and the food planning, the imbalance between the growth of population and the food supply may be offset in near future.

MORE ACRES BY PLANNING

By : **FRANCIS. V. THADIKARAN**

IN an agricultural country like India where uneconomic holdings are prevalent and under-employment is rampant, an increase in the economic supply of land is of paramount importance. To ameliorate the preasure of population on land and to mitigate the evils of sub-marginal agriculture as well as to augment food supply for the rapidly increasing population, an extension of cultivated area is absolutely necessary because there is a definite limit beyond which intensification of agriculture is neither possible nor profitable. The extension of cultivation to the existing culturable waste and current fallows necessarily involves land reclamation.

In India land reclamation on a large scale was begun in 1947 when India procured nearly 200 heavy D-7 tractors and other essential equipment from the U. S. army and in the same year the Central and State Tractor Organisations were set up. From 1947-48 to 1954-55 the CTO and STO's had reclaimed nearly 4.2 million acres, as shown below :—

Year.	C.T.O.	S.T.O's (000 acres)
1947–48	32	50
1948–49	70	65
1949–50	78	759
1950–51	258	504
1951–52	253	420
1952–53	266	258
1953–54	288	665
1954–55	187	
Total :	1432	2712

Besides these, the First Five Year Plan proposed land improvement operations like bunding and drainage to the extent of 3 million acres and also provided for the extension of mechanised cultivation to 3.4 million acres. A total of 3 million acres of private waste lands have also been reclaimed by the owners during the decade 1947–56. Altogether, only 10 million acres have been reclaimed so far in India, that is, 14 percent of the total area available for reclamation.

The bulk of the area to be reclaimed in India is infested with *Kans*. Of the land reclaimed so far, 34 percent constitutes fallow land covered with *Kans* and 66 percent land under cultivation but infested with *Kans*. The average increase in yield per acre is 8 maunds in the former and 2 maunds in the latter respectively.

By far the most important work of C. T. O. has been witnessed in Uttar Pradesh ; 3 million acres were reclaimed in Central India and the Bundelkhand division of U. P. ; in Ganga Khadir in the Meerut District, a jungle–covered tract of 47,000 acres has been cleared and sown ; and in the Nainital Tarai areas 41,442 acres of jungle lands have been converted into State farms and co-operative colonies. A farm of 16,500 acres, believed to be the biggest of its kind in Asia, has also been started by the State Government on lands reclaimed by C. T. O. Another achievement was the reclamation of a long stretch of thick dust–laden jungle scrub in Bhopal, besides the clearance of 2,628 acres of jungle in Assam. In Bihar 1.06 lakh acres of waste lands have been brought under the plough while in Madhya Pradesh 4,000 acres of *usar* and eroded land have been reclaimed. In Bombay 10.5 lakh acres were provided with bunds and 30,000 acres of saline land have also been reclaimed by constructing embankments.

Land reclamation presents problems of two classes : physical and economic. The physical problems include the extent of water supply for irrigation, the quantity of water to be removed by drainage, the location of dams, reservoirs and canals, their size and depth and the equipment to be used. The economic problems manifest themselves in the need for the products of the land to be reclaimed, the relative advantages of extensive cultivation, the desirable extent of public direction, regulation and control, the necessary types of organisation, the relation of costs and utilisation of benefits, methods of financing and ways of recovering costs. The economic feasibility of the scheme mainly depends upon the time lag between the incurring of expenditure and the incoming of receipts from the reclaimed land. Prompt and early settlement and development of the reclaimed areas, therefore, will ease the pecuniary difficulties of land reclamation.

The first Five Year Plan has earmarked Rs. 10.2 crores for reclamation and the increase in food production by extension of cultivation is estimated at 1.51 million tons. The original target fixed for the Second Plan is 0.8 million tons whereas the revised target is 0.94 million tons. The proposed reclamation under the Second Five Year Plan extends to 1.5 million acres of weed–infested

lands; 150,000 acres—at the rate of 30,000 acres a year—for contour bunding and terracing; and 2 million acres for other land improvement measures.

But it is estimated that we have nearly 85 million acres of arable waste land of which nearly 10 million acres are good and fertile. The Advisory Board of the Indian Council of Agricultural Research has roughly estimated the cost of survey and preparation of reclamation plans at Rs. 30,000 for a million acres and that for actual reclamation work at an average of Rs. 20 per acre. At this rate, the 10 million acres readily available at present will cost Rs. 300,000 for preliminary expenses and Rs. 200 million for the execution of the scheme. If this reclamation work is to be spread over a reasonable period of 5 years, the annual expenses will be little more than Rs. 40 million for reclaiming two million acres. According to the prevailing standards of crop production, the additional area will yield more than 6 lakh tons of cereals which may be of the value of Rs. 140 million. The yield per acre can further be increased by the adoption of scientific cultural practices like irrigation, manuring, double cropping, rotation of crops and mixed farming.

The fact that there is considerable scope in India for extensive cultivation—through irrigation of arid lands, drainage of marshy and water-logged areas, clearing weed-infested regions, levelling rugged lands, clearing bushes and jungle, improving the hygienic conditions of malarial tracts, and mechanised cultivation—needs no proof. But a conscious effort in this direction is yet to be made. Therefore, the C.T.O. and S.T.O's must be integrated to form a *Land Reclamation Consortium* as launched in Italy by the Act of 1933, which must formulate the plan for an *Integral* Land *Reclamation Programme* as an important adjunct to our Five Year Plans.

This *Konsortium* will be in a better position to make necessary arrangements with the Government to advance financial assistance (like *taccavi* loans) to the cultivators settled on the reclaimed lands so as to help them keep the land regularly under cultivation. In addition, the proposed *Konsortium* can maintain small fleets of light tractors at suitable centres to hire out to the cultivators for follow-up work.

On the side of organisation a definite attempt should be made to settle the land on the lines of co-operative colonies which will enable to impart to the farmers the much-needed spirit of co-operation. The success of such a programme undoubtedly depends upon proper planning based on a comprehensive survey of the country's natural resources. A co-ordinated effort by the Central and State Governments and the public on the lines of an Integral Land Reclamation Programme to harmonize natural environment, for enhanced human welfare will ensure work and higher social standards to a dense rural population.

PLANNING FOR TECHNICAL PERSONNEL

By: **Dr. P. C. BANSIL**

TECHNICAL know-how and technical personnel are a sine qua non for any plan of economic development. In the present age of specialisation, all fields of national activity-agriculture, industry, trade or transport-need the all time help and guidance from technically qualified persons. Not to speak of a country like India which has just been awakened after centuries of subjugation, advanced countries like those of UK., USA and Germany are finding their progress being hampered because of the shortage of scientists and engineers.

The first plan was drawn out under very special circumstances and it is but natural that due attention could not be paid to this most important problem. As the Planning Commission has put it "experience in the first five year plan bears out the fact that even in the more developed States, a moderate expansion in the development programme to be undertaken soon strains the available resources of technical personnel especially at the higher levels" ! ! It is under the circumstances encouraging to note that the Second Plan is quite conscious of the lacuna in this direction and is alive to it.

Assessment of the Available Resources

The first step is an assessment of the existing resources. It would look strange that even in a country like India where hardly 14 to 15 percent of the persons are literate, and facilities for technical or higher education are rather negligible, it should be difficult to know the existing number of technical persons. Whatever the case, the fact remains that no up-to-date records are available in this respect. Education Ministry brings out every year a list of the numbers passing the various University Examinations. These records are no doubt available over a number of years, but are least helpful in the sense that what we are concerned with is not the total out-turn, but the total availabilities. Many a factors like the migration of people to Pakistan have come in and it has become rather difficult to make a correct assessment of the situation.

Again, in the absence of accurate life tables it is not possible to estimate the normal wastage from year to year. It would, therefore, be extremely necessary to find out first of all the number of technical personnel in the various fields at all levels. Some work of the nature has already been done by the Scientific and Technical Manpower Division of the Planning Commission, but much more needs to be done.

Future Requirements

A still more difficult task is an assessment of the future requirements. This is a very complicated issue, beset with a number of obstacles. The need for technical personnel has to be co-related with the development programme. Without a proper insight into the perspective plans of the country, a planning for technical persons becomes a mockery.

It takes, for example, at least 4 to 5 years to produce an ordinary engineer or a doctor. The minimum period of advance planning in this field is thus of the order of 5 years. It would, however, be advantageous to have perspective for 10 to 15 years.

Since it is difficult for the administrators who are normally responsible

for putting up the demands, to form correct estimates of the real needs, it would be better if some specialised organization is set up to undertake the job. Even then it is quite possible that in their zeal and enthusiasm, the State Governments may put up exaggerated demands. It would then be the responsibility of the Centre to look into those demands carefully and prune them wherever necessary.

A more careful examination at this stage is important because the setting up of a new institution involves huge financial commitments and requires expert staff for which there is bound to be a proverbial shortage in all under-developed countries. We will come back to this issue later on, while dealing with the implementation of the final targets.

Other steps necessary for coming to a firm decision are the formulation of a number of approriate *norms* and co-efficients. This will consist of

(a) relation between production *norms* and technical persons for the different sectors separately.

(b) ratio between engineers and technicians.

As regards (a), it has to be decided more on the basis of the example of advanced countries as to howmany technical hands will be needed to produce a specific unit of a commodity, say, cement, coal or steel. Such a decision will be more intricate for the agricultural sector. All foreign experience has to be made use of here with guarded care. Besides the differences in soil and climatic conditions, economic and political set ups vary widely from country to country.

Agriculture in China for example, is being run by mainly the co-operatives. Agricultural extension in that country thus consists of Technique, Popularisation Centres where the Presidents and Vice-Presidents of Co-operatives come to learn the new and improved systems. Similarly, in Japan, the educated cultivators work as volunteer co-operators to serve as a laision between the cultivators and the experts. Under both the Chinese and the Japanese systems, the ultimate responsibility for the spreading of the results of the laboratory is that of the members of the peasantry themselves.

The conditions in India on the other hand are different. The whole of the responsibility here is that of the Government. After ten years of independence, the falacy of 'outside benefactor' is still deep rooted in the cultivator's mind and he judges every governmental activity with scepticism. This raises the necessity of deep thinking not only with regard to the number of technical personnel needed in agriculture, but also their type.

As for the ratio between the engineers and technicians, foreign experience can be of immense value. Various US studies have, for example, indicated that industry can use to advantage from 2 to 5 technicians to each engineer. Similar ratios will have to be worked out for an optimum level of technical manpower utilisation. It would be of interest to note that a proper balance of the nature is absent even in the USA, thus indicating a clear lack of planning.

A study by the Technical Institute Division of the American Society for Engineering Education, covered 200 institutions. Nearly 10,000 students graduated from these institutions in 1954. Their number went up to 12,000 an increase of 20 percent, in 1955. But this works out to nearly half a technician to every engineer instead of the 2 to 5 technicians industry could use. We will have to plan in a manner so as to obviate all such disparities.

Competing Needs

Some tentative figures about the total number having thus been decided upon, the next question will be the allocation of the scarce resources to the various competing sectors. The limited trained scientific manpower has to be shared by industry, the Universities and the Government alike. This will depend upon the priorities which the nation would like to attach to the respective sectors. Men, money and material being limited, such a step becomes extremely necessary. A further distribution would perhaps be necessary as between.

(a) the public and private sector

(b) within the public sector itself, between Central Ministries, States' Public Corporations and Local Bodies.

Maximum Utilisation

Professor Arnold of the Minnesota University very rightly pointed out once that the extent to which one can utilise anything depends upon the quality and the quantity of the thing itself and this applies particularly to scientific manpower. It is generally realised even in countries like the U.S.A. and Canada, that technical and scientific personal are not all being utilised to their best advantage.

One step in the direction is the creation of conditions to encourage maximum job satisfaction and productivity. All the existing technical manpower should first be placed at their appropriate stations in accordance with their qualifications and experience.

The Report of the Engineering Personnel Committee pointed out in this connection that a systematic survey should be conducted by the employers, particularly in the public sector, with a view to assuring that all employees with engineering experience are fully engaged in activities which make for maximum utilisation of their talent. Economy can be achieved in the use of personnel resources according to the Committee by undertaking such a job analysis and on its basis dividing job functions and allocating only the more complicated operations to qualified persons. The essence of planning is to avoid not only unemployment but also over-employment as well as under-employment.

This having been done some uniform service conditions will have to be formulated so as to avoid any unnecessary shiftings and heart-burnings. All intelligent and honest workers should have sufficient incentives to rise to higher and better positions without any kind of favouritism.

Educational Planning

The last but certainly not the least is the question of proper planning for the production of the requisite number of persons of the requisite types. This is concerned with the provision of educational facilities. Effort has first of all to be made to make full use of the existing technical institutions. The admission capacity of each institution should be fully utilised and huge wastage of students which is said to be of the order of 20 to 25 percent in many of the professional courses should be reduced to the minimum.

Instances of deterioration in the quality of engineering personnel turned out were brought to the notice of the Engineering Committee. This lowering of the standards were attributed by the Committee to :—

(a) dearth of teachers of right calibre ;

(b) inadequate facilities for practical training ;

(c) ineffective methods of examination and enforcement of standards.

Supply of Teachers

While immediate steps need to be taken for the eradication of all these defects, a discussion about the supply of teachers is most important. Over a long period, the teacher shortage–in quality as well as quantity–is likely to be one of the most difficult manpower problems. Special Committee on Manpower Policy in the USA pointed out that the process of finding men and women of quality to teach their successors in the next generation is always subject to strain all along the line.

Firstly, the abler college student does not seem to be attracted towards education. Secondly, there is a tremendous attrition of the University staff because of the allurement and attraction of Government jobs. These questions are solved in Germany by requiring their students to choose their professional fields at a much earlier date of their educational career. They have also developed a proper and respected place for the teachers in the public eye and an appreciation of their role as curious scholars. Unless 'respect for knowledge and hard work' is adopted as the national slogan, it may not be possible for the country to solve many of these tricky problems.

Conclusion

It may be stated in conclusion that if India is to continue her technological and economic progress (which undoubtedly she must) it will be necessary to increase the supply of technical and scientific manpower, utilise this manpower in a most effective manner, and ensure that professional persons are kept in useful employment as long as possible.

CRITERION FOR THE FIXATION OF CEILING ON LAND HOLDINGS

By : **SHARAD CHANDRA JAIN**

THE need of 'ceiling on landholdings' in the process of land reforms is widely acknowledged. Ceiling is, needless to say, a very complex problem and its techniques are not yet fully developed. The difficulties of fixing a ceiling in a democratic society are well–known, since goals as well as means are subject to democratic choices of the population and thus require agreement and support. The scope of this paper is to examine the criterion for the 'fixation of ceiling on land' which may provide incentive to agricultural production' increase in farm income', 'distribute land to the tillers', and, 'secure all the benefits above costs'.

There has been in the last six months, a wide–spread controversy about fixation of ceiling on land either on area or on income basis. In Rajasthan, Andhra and Punjab ceiling has been linked on land incomes. And recently the Madhya Pradesh Government's mind appears to be working on fixing a ceiling in terms of income rather than acreage. The Madhya Pradesh Government seems to have been influenced in this regard on the parallel line followed by the other States. There may occur controversial views about the limit of income which should be taken as a mode while fixing a ceiling on land. And if the majority agrees on some income limit, it cannot satisfy minority representing a section of population. Some may say, it is too high, other may think, it is too low, but no one will bother

to enquire whether the yardstick of income is at all convenient or proper ?

If this yard stick is used, the States may have a chaotic maze of ceiling. Let us first of all divide in simple terms our agriculture in two parts, viz :—

(a) *Agriculture in advanced stage, i.e.* where irrigation facilities are available. Input factors, like good seeds, manures and fertilizers, etc., are always used, and other intensive methods of cultivation are practiced, Bunds are constructed and to some extent minor scientific appliances are used. Investment on agricultural lands are always possible and has been a common feature.

(b) *Agriculture in backward stage* : This is the case where neither the irrigation facilities are available nor inputs like manures and fertilizers are used. There is always a danger of crop failure due to weather conditions, and no investment in land is expected.

Now suppose in a rice growing region of say Madhya Pradesh an annual income of Rs. 4000 per family of five members (as fixed by old M. P. Land Reforms Committee) at current prices and yields will mean at least 150 acres of land. If the area is irrigated, the yield will be higher and the ceiling proportionately reduced to about 100 acres. In the case of millets the ceiling will have to be higher at about 175 acres or higher. In a region producing commercial crops it may have to be as low as 75 acres. A more complicated case is that of areas where food crops rotate with commerical crops which is a sound agricultural practice.

Price Factors

But it has been said that in Indian agricultural sector income is not a fixed concept and nothing can be based upon its foundations, because 75% changes in crop production are due to weather conditions. Furthermore there is the question of fluctuating prices. In the absence of stable guaranteed prices land which yields an income of Rs. 4000 in one year may yield very much more in the next if the prices of the produce go up or very much less if they fall. It was because of these difficulties that the Planning Commission observed, "The balance of convenience lies in favour of each state specifying, according to the conditions of different regions, classes of soil, irrigation, etc., the area of land which may be declared as a family holding".

Profit depends upon the prices of the produce which are sold in the market by the cultivators, the cost of cultivation does not vary very much from year to year. If the prices are assured then the profit will increase to a large extent and less area will be needed in order to earn the desired income.

The fixation of ceiling on the basis of income in itself is discriminatory to some extent between the efficient agriculturist whose yield is more from a given piece of land and an idle agriculturist who has insignificant income from the same piece of land. The fixation of ceiling in such cases will naturally be discriminatory. It would only mean that those who are efficient farmers will be hit more than the inefficient farmers. This hardly should be the intention of land reforms.

In an under-developed country, where most of the cultivated area is under inefficient production techniques, in the sense that there are no irrigation facilities, no good seed, proper manure and fertilizers are applied, prices are not assured aud the cultivators are reluctant to adopt scientific practices of cultivation, to fix a ceiling on income basis will ruin the long term aim for which the ceiling

is being imposed. It may result a fall in production before and after the ceiling is being imposed due to psychological factor working amongst the cultivators, which is a major setback for Indian agriculture.

Technical Data

At this stage we do not have technical data about the increase in production through any technical advancement. In other words a sufficient detailed, reliable input-output matrix has not been developed yet, which may provide the planning authority with useful information about the output for a given quantity of input. If the ceiling is fixed in all areas on income basis and if a single cultivator, for example, is allowed to retain an area as large as 150 acres in order to earn a desired income as fixed in ceiling today, he may earn double the income fixed in ceiling tomorrow-by adopting modern methods of farming, resulting an increase in farm production. This is the one side of the picture. The other is that if the ceiling is fixed on area basis (for all areas) and the acreage per family is kept as low as 75 acres, the cultivator here also may work more, adopt modern methods of cultivation in order to make his both ends meet, resulting a substantial increase in agricultural production—and income as well.

Thus the area basis ceiling gives him more incentive for increasing farm production. Although incentive for increasing agricultural production works in both the cases; but the difference lies in the fact that in the former case a large area gives him incentive to produce more, and in the latter case a small area (about half of the former) gives him the same incentive for more production. It should be proper to mention here that in an under-developed country both these phenomena work simultaneously. But in the former case, one must be alert.

An average Indian cultivator who is much more inefficient and primitive in his production practices and does not work for increase in income, because he is always satisfied with whatever income an average farm gives, may not be easily ready to work more scientifically in such a large area for increasing his income. Even he will not be able to supervise such a large area and will start giving sub-lease on cash or kind rent. But in the later case where a ceiling is fixed on acreage basis a little pursuation may induce him to intensify cultivation by adopting modern practices and increase his net income from the same 75 acres of land and increase his agricultural production.

Here a partinent question arises? If the ceiling is not fixed on income basis which means allowing large areas (i. e. 200 to 300 acres to earn a desired fixed income) because most of the land is under less developed and primitive cultivation practices where no input is applied except human labour, the private investment in land will practically become impossible, because there will be no investment in land if the ceiling is fixed on acreage basis which allow somewhat small acreage compared to income basis ceiling.

It is proper to mention here that the data of private investment in land are not available for the whole country. But wherever the figures are available it gives a sorry picture. For example "in case of Bombay province the investment on land improvement was about Rs. 4/- in 1948-49, which rose to Rs. 7·9/- in 1953-54. per acre on owner cultivated plots. And about 70% of this total investment was on irrigated, well developed agricultural areas and only 30% on less developed areas where no irrigation faci-

ities are available and overall backward in agriculture." [1]

" In Madhya Bharat region of the reorganized Madhya Pradesh the private investment in land is only Rs. 2·40 in case of residents and Rs. 1·65 in case of non-resident ex-zamindars, jagirdars, per acre per year from 1954–55 to 1957–58 (May). It should be mentioned here that these ex-landlords have resumed large areas under personal cultivation which comes to nearly 465 acres per ex-landlord. While in the case of ryotwari areas the investment per acre per year is nearly Rs. 4·50/- in the same year". Here it has been seen that near about 75% of this total investment per acre per year is on the land which is irrigated and well developed". [2]

So, in the well developed agricultural areas where irrigation is available, good seeds, manures and fertilizers are applied, intensive cultivation is practiced and cultivators are conscious for increasing agricultural production, investment in land is a common feature and always possible with a little persuation. And if the ceiling is fixed on income basis in such areas it is perfectly justified. But where agriculture is backward and investment in land is practically nil to fix a ceiling on income basis will not achieve the desired end, there will be no increase in total agricultural production. Here it must be kept in mind that large holdings are not an index for more investment in land in our country.

The idea of imposing ceiling is two fold; to obtain a large enough pool of land to satisfy the land hunger of the marginal peasant and the landless labourers and to promote personal cultivation. Both these objects can be achieved satisfactorily only if the ceiling is fixed according to the area basis (where agriculture is unirrigated and backward which an average family can cultivate with its own labour. The farmer can always increase his income from such a small farm by improved techniques, irrigation, and joint cultivation. One should also not ignore the contribution to the social and political stability which the land owning peasantry will make–a factor so important in a democratic country where techniques of democracy are yet to be developed. The fixation of ceiling on income basis in less developed agricultural areas which form nearly 80% of the total agricultural land of the country will result in allowing more areas, thus less opportunity for distribution among landless peasantry. This will have an impact on the nation's economy as a whole. The landless labourers who are staying in the village in the expectation of getting some land, as they were given assurances for land at election time by all political parties, will start migrating from rural areas. This will have two immediate effects :—

(A) Shortage of labour in villages at sowing and harvesting time. This will check intensive cultivation resulting a fall in agricultural production.

(B) Impact on marketable food surpluses. The marketable food surplus is bound to decrease, which is for urban population, resulting some increase in prices.

If the 'unused' labour migrates from the villages it may have little effect on the village economy. But if the 'disguised' unemployed labour migrates it will definitely result a fall in agricultural production.

1. V. M. Dandekar and G. M. Khudnapur, "Working of the Bombay Tenancy Act 1948. Report of investigation. Page. 142–144. (1957).

2. Results based on my own sample survey in connection with collection of data on "Working of Land Reforms In Madhya Pradesh. (May 1958),

Danger Of Class Conflict

Even if the labour does not migrate from the village then also there is a danger of class struggle. The labourers who work on the farm of others and who are unable to feed their belly properly will be influenced by any political party who might assure them for giving land and for an incresse in their wages. It will not be difficult for these parties to influence them by the above two slogans, and control the labour class at least. Thus a class struggle can easily be created between landed peasantry and landless labourers, resulting in the fall of production and a shortfall in the production targets of the second five year plan. So mere fixation of ceiling, however, has little meaning if it is not carried to its logical end. This end is the distribution of the excess lands to the landless.

One of the principles usually adopted in determining the ceiling is that the holding should not be much bigger than what a family can cultivate with the help of family labour and hired labour only now and then. It will check sub-lease of land to a large extent, as sub-lease is usually given by the owner of large areas. If the ceiling is fixed on income basis which allows large areas for a desired income limit in an under-developed country, we can never put an end to sub-lease, which is the worst method of cultivation. It seems unjust on the very face of it to let one person have an holding, cultivated with the help of a number of hired labourers and so allowing many to remain landless. While fixing a ceiling it is, however, necessary to see that the existing production does not fall. On the other hand, it should increase the efficiency of agriculture in relation to output.

The above discussion leads one to an inevitable conclusion about the criterion for the fixation of ceiling on land, which is as follows :—

	Criterion for fixation of ceiling
(A) Agriculture in Advanced Stage :—	
Area under irrigation and improved method of cultivation, where intensive cultivation is being adopted and there are fair chances of improvement of agricultural lands.	Income Basis
(B) Agriculture In Backward Stage :—	
Area under less developed agriculture without irrigation or any improvement, where there are chances of crop failure due to weather conditions., etc. and the intensive method of cultivation has not yet been adopted.	Area Basis

If the ceiling is not fixed on this criterion, then there is a great danger of conflict among cultivatiors and there are definite chances of dissatisfaction among peasantry against the government. For instance, in a village, if the ceiling is purely based on income basis, and suppose for an income of Rs. 4000/- the irrigated and well intensified cultivated area required, is 75 acres, and the under developed or backward agricultural area be fixed between 175 to 200 acres. Then the cultivator in the later category if he makes available irrigation facilities and other modern agricultural techniques, through his own or government effort, may earn an income of at least Rs. 8,000 to 10,000 and the cultivator in the former category will be much dissatisfied because he will have the same small area for the desired income limit. Thus there are chances of struggle among both. But if the ceiling in the latter case (backward agricultural area) is

fixed on acreage basis, not very liberally, (usually it should be at least ¼ or ⅓ more, compared to the ceiling fixed on income basis in the advanced agricultural areas) then his incentive for production will increase and he will follow the improved practice for development of his agricultural land and investment in land will increase. He will practice intensive cultivation using good seeds, manures, and fertiizers., etc. in order to earn more income.

Thus, it will be proper to suggest that where agriculture is in a backward stage, the ceiling ought to be fixed on area basis, though not very liberally. On the other hand, where agriculture is in advanced stage equipped with modern technological advancement the ceiling ought to be fixed on income basis. There is always some fear in fixing ceiling on income basis in case of agriculture which is backward and undeveloped. They are :—

1. The production cannot increase, because incentive will be checked due to more liberal ceiling which fixes large areas,

2. Land cannot be released for distribution to the landless.

3. It makes peasantry dependant on sub-lease (because more area will be fixed).

4. Intensive cultivation cannot be possible.

If we fix a liberal ceiling on area basis, it may become impossible to achieve the desired end. It will be always better to give up idea of ceiling than to impose a liberal one, because ceiling is not the be-all and end-all of all the land problem. The main problem that remains to be solved is that of accelerating agricultural production. This can be achieved best by co-operative farming, after imposition of ceiling on land, which provides a good-deal of initiative to all those who till the land.

Conclusion

The main conclusion emerging from the paper can be summarised as follows :

I. Two criterions have been developed recenly for the fixation of ceiling on land holdings, viz., on income basis and on area basis.

Fixation of celing on income basis for all areas will not help increasing agricultural production. The areas which are advanced in agricultural practices provide incentive for land improvement and increase in agricultural production.

III. Fixation of ceiling on acreage basis for areas backward and under-developed in agricultural practices provide incentive for increase in agricultural production, provided the area fixed for present acquisition is not more than ⅓ or ¼ times the area fixed for ceiling on income basis (for areas which are advanced in agricultural practices).

IV. The ceiling on present acquisition of land on income basis should be fixed in areas which are irrigated and well advanced in agricultural practices. For areas which are backward in agricultural practices and where no irrigation facilities are available, ceiling should be imposed on area basis.

V. If this method is being adopted, it will check sub-lease, release land for distribution among landless, provide incentive for investment in agriculture, and also result in increase in agricultural production.

WATER CONSERVANCY IN FARM FIELDS IN NEW CHINA

By: **HSU TA**

CHINA'S vast territory lies in the temperate, frigid and sub-tropical zones. Its topography is most varied, and mountain terrain and hilly regions occupy above 70 percent of the total area. The difference in climate and rainfall is very great. Along the South-eastern coast annual rainfall reaches as high as 1,500 to 2,000 mm., while in the far Northwest it is as low as less than 300 mm. Monthly rainfall also varies a good deal. In South China, rainfall for the months of May, June and July amounts to over 50 percent of total annual precipitation. In North China July, August and September account for 60 to 70 percent of its annual rainfall. The threat of floods and water-logging is thus obvious during the rainy season. In drier seasons, on the other hand, there is no rain whatever for months, and severe drought will result. Under such conditions, the building of water conservancy projects is of tremendous importance. Our great leader, Chairman Mao Tse-tung, has pointed out that "water conservancy is the key to Chinese agriculture". It is a brilliant conclusion on the characteristics of agriclture in China.

The Chinese have a long history of over 4,000 years in building water conservancy works. Rivers are numerous and water resources are especially rich. The total volume of flow of more than 6,000 large and medium-sized rivers averages 2,700,000,000,000 cubic metres. If this amount of water is fully utilised, it will irrigate more than 10,000,000,000 *mou* of land. There are also inexhaustible underground water rssources which can be utilised for irrigation purposes. Our ancestors have continuously made use of these rich water resources to irrigate fertile fields which fed millions and millions of people for thousands of years. But owing to the fact that China remained for a long time in the feudal and semi-feudal, semi-colonial state, the development of irrigation was restricted. Progress was especially slow during the past few decades when China fell under the yoke of foreign imperialism and the reactionary Kuomintang regime. Even the old water conservancy works handed down from ancient times were either neglected or wantonly destroyed. On the eve of the liberation of China's mainland, the total irrigated area dropped as low as 230 million *mou*, only 16.3 percent of the cultivated land, while the remaining 83.7 percent were constantly menaced by drought. In addition, approximately 400 million *mou*. of low-lying lands frequently suffered water-logging. Both constant flood and drought seriously threatened farm output as well as the livelihood of millions of Chinese peasants in the old days.

Since the founding of the People's Republic of China in 1949, in order to conquer flood and drought and restore and develop speedily agricultural production, the government has taken vigorous steps for water control. Those rivers which caused the most havoc received first attention while active measures were taken to improve irrigation facilities. On the one hand repairs were made to the old water conservancy works, while on the other, loans, construction materials and technique were provided to help the peasants build small drainage and irrigation systems all over the country. Meanwhile, the State concentrates its capital investments on the construction of large irrigation and drainage projects.

During the 3-year period of restoring her national economy, China not only rebuilt and repaired all the previously neglected and destroyed irrigation systems, but also built more than 1,300,000 small new canals, ditches, ponds and dams in all parts of the country. She also dug 1,500,000 wells, increased 380,000 water-wheels, pumps with a total of 30,000 horsepower, and built over 130 large irrigation and drainage projects. And together with the land reform movement, a democratic reform also took place in the irrigation administration. The feudal system of organisation and control was replaced by a new democratic form of administration by the peasants themselves. Thus the total area of irrigated land increased by more than 80,000,000 *mou*. With better irrigation and drainage, flood and drought calamities became less severe.

In 1953 China began her First Five-Year Plan for the development of her national economy. The irrigation tasks set forth in the Plan were : the mobilization of the local governments and the people to build small irrigation projects, improve old irrigation systems, strengthen irrigation administration, build important large and medium irrigation projects, and with the collaboration of agricultural and technical agencies to take active measures for water and soil conservancy. Small power stations will also be built in some selected localities in the countryside.

During the First Five-Year Plan, water conservancy developed tremendously. Irrigated land increased by over 210,000,000 *mou*. Together with the previously irrigated land, the total irrigated area reached 520,000,000 *mou*, or about 30 percent of all the cultivated land. In other words, every peasant in China averaged one *mou* of irrigated land. The original facilities irrigating 310,000,000 *mou* of land also became more efficient in preventing flood and drought after repairs and improvements. The easily inundated lowlands also received due attention. An overall plan was worked out to retain water on the upper reaches of rivers and to dredge channels and drainage ditches on the lower parts. Lakes and Swamps are utilized to store up water for irrigation and help discharge the excess of water during rainy seasons. The growth of rice and other water plants, and the development of aquatic products have rapidly improved the production on the lowlands. At present about 22,000,000 *mou* of easily flooded land have been freed from the worst flood once in every five years.

During this period, the work of soil conservation in China has also developed. There were about 1,500,000 square kilometres of mountainous slopes that have lost their ability to retain rain water as trees and bushes were completely destroyed during the past few decades. This caused not only the soil to be washed down whenever it rained, but also calamities of mountain torrents and drought. The great amount of soil carried downstream caused river beds to rise through sedimentation, thus making floods more frequent and severe on the lower parts of the rivers. It is of paramount importance, therefore, to take drastic steps to put an end to such disasters through afforestation, building terraced fields, constructing dams to check the flow of sand and silt and building reservoirs and pools to store up rain water. These measures have already prevented 190,000 square kilometres of land from erosion, while developing agriculture, forestry and animal husbandry in the hilly regions.

During the First Five-Year Plan period, the building of small hydro-

power stations in the countryside was also started. Over 400 stations were built, with a capacity of more than 10,000 kw. On the grassland, experiments were made to irrigate the pastures. All these undertakings served as models in China's attempts in rural electrification and irrigation of the grassland.

Great achievements have also been scored in controlling irrigation systems during this period. Large irrigation projects built in ancient times have either been repaired or rebuilt. Locks were added to irrigation networks together with the setting up of control stations to regulate the flow of water in all channels and ditches. In some places, irrigation ditches criss-cross the fields, raising the efficiency of irrigation and broadening the area benefited from it. Every irrigation project, old or new, adopted some technical reform in irrigation. Levelling of land was carried out and irrigation ditches were built in the fields. For dry-land crops, channel, bed or storage method of irrigation was introduced, while more scientific ways of watering paddy fields were also practiced. The advanced experience of the Soviet Union in planned use of water in irrigation was adopted. It not only saved a lot of water, but also markedly raised agricultural yields. It prevented the rise of subterranean water levels in the irrigated areas and the soil from becoming saline or alkaline.

The achievements of the water conservancy work during the 5-year period were reflected in the important part it played in raising agricultural production and changing the economic conditions in the countryside. In general, fields that have received the benefit of irrigation or those that are freed from floods all increased their yields 50 to 100 percent, some as high as 200 to 300 percent. Some fields changed from one crop a year to two or even three crops. In the construction of water conservancy projects, rich and systematic experiences were also gained. Countless technical personnel, including over a million peasant technicians were trained in the process. This army of experienced irrigation technicians paved the way for a greater amount of water conservancy work to be done during the Second Five-Year Plan.

In 1958 China was embarked on her Second Five-Year Plan of construction. As it started off with the big leap, water conservancy also took on wings. From local and scattered stage of struggling with flood and drought China has started to build a systematic and over all irrigation scheme in order to rid the menace of flood and drought once for all. The goal is to realise irrigation in all her cultivated land or in other words, 75 to 90 percent of the cultivated land shall be brought under irrigation so that in spite of very adverse climatic conditions of long drought, bumper harvest can be guaranteed. On the other hand, should there be an unusually heavy downpour of 100 to 800 mm., no flood would result.

Since water conservancy work for the Second Five Year Plan started in October, 1957 (It is customary to begin a water-conservancy year in China from October to the end of September of the following year.) millions of peasants have put their shoulders to the wheel in changing the face of nature on a tremendous scale, the magnitude of which is in every sense like "moving mountains and seas". From the extreme north to the south, from remote mountains to hills, plains, lowlands and the coast, one sees multitudes of people working under red banners during the day and under the glow of lanterns at night. One can hardly imagine the power of the labouring people and the speed in which they have transformed nature with their own hands.

From October 1957 to the end of July 1958, the total area of land brought

under irrigation increased by 450 million *mou*. This figure is twice the amount of land irrigated by Chinese peasants during the past 4,000 years, and is greater than all the land brought under irrigation throughout the world from 1935 to 1955. At present the total amount of irrigated land in China has exceeded 970 million *mou*, equivalent to about 57 percent of all the cultivated land in China or about one-third that of the whole world. At the same time, old irrigation facilities capable of watering 170,000,000 *mou* have been improved while another 230,000,000 *mou* of lowland have been freed from floods. Soil erosion over an area of 250,000 square kilometres has been brought under control. Many new hydro electric power stations have been built in the countryside, with a generating capacity of over 90,000 Kw. The total amount of earth and stone work completed exceeded 51,700 million cubic metres. If a road-bed of 10 metres wide and 1 metre thick were built, its total length would be 5,170,000 kilometres, or approximately 13 times the distance between our planet to the moon.

The building of large scale water conservancy projects in China have brought about a striking change in her look. Out of a total of some 2,100 counties, the land in 610 is practically well-irrigated, reaching the goal that "no floods will occur after heavy rainfall and bumper crops are guaranteed in spite of drought." In hilly regions where water was extremely difficult to get for men and beasts for thousands of years past, meandering irrigation channels and ditches are full of water, and countless ponds and reservoirs also dot the place. In the low-lying areas where people were mercilessly menaced by frequent floods, fish ponds and rice-fields have replaced the old desolate scene. The rivers brought under complete control are tame now as no rushing of torrents happen again. This big leap in irrigation has had great effect on agricultural output this year. During last spring and summer, New China had the severest drought over the largest area since 1949, but owing to her water conservation facilities, the drought was successfully overcome. An unprecedented bumper summer crop was harvested, netting an increase of 41,300,000,000 catties of grain. Early rice and spring wheat also scored an increase of over 40,000,000,000 catties. These facts undoubtedly prove that China has gained complete victory over drought. The new dams, dykes and other irrigation projects built this year have also stood the test of heavy rains without any mishap. In some localities about 450-550 mm. of heavy rainfall occured, but the rising waters were held back by dams without causing flood disasters. In the few localities where flood did occur, the severity was but a small fraction of what it used to be when equal rainfall happened in the old days. The volume of flood waters and crest of waves caused by heavy rainfall in rivers under control have also been decreased many times.

The large-scale development of water conservancy work has unearthed the ingenuity and resourcefulness of the people. Their creativeness has greatly added to the experience of our ancestors in this field. On the basis of the creativeness of the masses, a new policy was adopted i.e. the emphasis should be on storing of water, the building of small irrigation projects by farm co-operatives, thus breaking away from the old conception of primarily relying on "point" and "lineer" control projects along the rivers. The new policy, therefore, is to build simultaneously all kinds of small-scale irrigation projects all over the river basin from the upper to the lower reaches, on mountain terrain, in

hilly areas, on plains and in the lowlands, and on this basis of scattered interception of surface flow is added the "point" and "linear" control schemes along the rivers. This means that the present method of water conservancy is based on the building of small irrigation projects with medium ones as the backbone working in combination with large schemes. The carrying out of this new policy relies primarily on the joint efforts of over 600 million people of China. Only through their common endeavour there is the possibility of realising the goal of an overall development of water resources in a "more, faster, better and more economical way" and fundamentally wiping out flood and drought disasters. In dealing with the problem of water-logging of low-lying regions, a change has also taken place. The method of purely draining out the water from these areas gave way to digging a network of irrigation canals over large stretches of land so that drains, ditches, ponds and wells will criss-cross one another in a very close manner. The combination of this kind of small and large networks stores up and traps rain water for irrigation and transportation purposes. As a result, villages and co-ops are now linked together by a network of waterways. The development of aquatic products has also made good headway. After meeting the needs of irrigation, transportation and the development of aquatic production, excess water is drained off through innumerable canals, ditches and rivers. In hilly regions, experience has been gained in automatic-flow irrigation by building rivers, ditches ponds and reservoirs inter-connected with one another. In this way, all water from rivers, rains and springs is brought under control and fully utilised to solve the problem of water needed for irrigation. Rich experiences have also been gained in the improvement of irrigation techniques, the control and prevention of soil erosion and the utilisation of water power. Many kinds of complicated techniques in water conservancy work are now mastered by the broad peasant masses who further develop them. They have not only succeeded in building all types of earth dams, but stone and stone-and-earth ones of every description. They have successfully built dams of 20 to 30 metres high and can even build larger ones of 40 or 50 metres high. Cement made by the traditional method and all kinds of improved, semi-automatic irrigation equipment have been successfully made in many places and put to good use. As irrigation techniques are popularized in China, there is every possibility of raising them to higher levels within a short time.

Water conservancy projects for 1959 will commence on October 1958. They will grow with greater momentum and on a larger scale during the coming year. The 500 million peasants of China will, under the inspiration of the General Line of Socialist Construction, exert all their efforts to press ahead in order to build socialism in a more, faster, better and more economical way. Following the policy of putting the emphasis on tropping and storing water, the building of small irrigation projects by the co-ops, they will try to develop China's rich water resources systematically and comprehensively. They will work hard for another winter and spring in order to bring all cultivated land in China under irrigation.

In places where this target has already been achieved, attempts to further consolidate the results and raise the efficiency of irrigation projects will be made. The ultimate aim will be : terraced cultivation on mountain slopes, a network of rivers and canals on the

plains, reservoirs in the lowland and valleys, systematic stepping down of river courses, systematic utilization of engineering projects, the beautification of farm lands into gardens, the mechanization of drawing water, the utilization of water power to generate electricity, the multiplication of aquatic products and the afforestation of all barren hills and slopes. Then flood and drought disasters will never appear in China forever. The Chinese people will then gain complete control over Nature and transform it so as to serve the big leap in agricultural production in China.

1 *mu* = 0.1647 acre 1 catty = 1.1023 pounds

"ECONOMIC PROBLEMS OF ANIMAL HUSBANDRY IN INDIA"

By: **T. K. METI**

ANIMAL husbandry can be defined as the art and science of breeding, feeding and caring for farm-animals so that they may be healthy, productive, reproductive and useful to man. Economist need not be afraid of technical nature of the subject as he is concerned mainly with its economic aspects. The scope of the subject may be said to comprise the study of (a) the role of animal husbandry in the economy of a nation as a whole, (b) animal husbandry conditions, (c) dairy aspects, (d) economy of draft-power on the farms, (e) practices and malpractices in the marketing of cattle and cattle byproducts, (f) utilization of byproducts of naturally dead and slaughtered animals, (g) cattle insurance and (h) income and employment potential.

The Role of Animal Husbandry

Animal husbandry is a much neglected resource of India in the sense that only 1.1 percent of the total outlay adumbrated in the second plan, has been earmarked for its improvement whereas it contributes 10 percent of the total national income, excluding the labour-value of working animals. The importance of animal-husbandry lies in its lending physical as well as economic welfare of the country by means of nutritive food, draft-power, soil-fertility and some of the useful products like leather and glandular products. Food is the fuel which keeps the fire of life burning. More so is the balanced food, which serves the physical welfare of the people in terms of efficiency and longer productive life. The composition of the balanced diet includes, among other things, dairy products, meat and eggs which are of higher nutritive value and which are the derivatives of animal husbandry. These derivatives provided proportionately in the diet would no doubt increase the efficiency and the average expected life of Indian that is at present deplorably low. Inadequacy of the present consumption of protective foods can be illustrated by quoting an estimate of the percentage-increase in the production of various protective foods required to provide a suitably balanced diet in minimum quantity for the whole population of India, viz., "cereals by 10%, pulses by 20%, fats and oils by 250%, fruits by 50%, vegetables by 100%, milk by 300% and fish and eggs by 300%"[1]. Animal husbandry, the source of higher nutritive articles of food, therefore, needs to be improved.

1. P. 2 "Memorandum on the Development of Agriculture and Animal Husbandry in India, 1944"

Secondly, bullock, the offspring of cow, forms indispensably the draft-power in Indian agriculture. Even in America the pioneering country to have its agriculture mechanised to a great extent, power animals claim about 25% of the total draft-power on its farms. Especially in under-developed countries, which lack in adequate capital, technical skill, large-sized holdings and cheap fuel-supply, pre-requisites for power-mechanization, the power-animal play a considerable role in agricultural sector of such countries for many a decade to come.

Thirdly, animals are the source of by-products such as leather and glandular products, organic manures etc. Leather products like shoes, leather-bags, mhotes, ropes etc., are some of the necessaries of our daily life. Glandular products-insulin, liver-extract, pepsinadelin-serve as drugs to strengthen the life of people suffering from diabeties and anaemia. Organic manures as dung, urine, blood and bone, help the land to conserve and continue its fertility.

Fourthly, there is an abundance of such things, not consumed either by human beings nor usefully utilised by any other industry, as fodder, grass, and some herbs which can be very well converted into animal feed. As a matter of fact, more than 65% of the total agricultural area in the world is the permanent meadows and pastures. In the words of one author: "All the energy on this planet originates in the sun and the majority of it is stored here in farms that man cannot use directly e.g., grass, straw, stalks etc. Domestic animals are merely machines that man has adapted to convert these stores of otherwise unusable energy into useful forms".[1]

1. P. 46. "Breeding and Improvment of Farm Animals" by V. A. Rice.

Finally, right from the emergence of the 'Homosapiens' down to the present age animals proved to be useful in cultivation, in worship, in war and last but not least in pleasurable diversion. Even in the modern civilised age some of the domesticated animals claim, to some, to be a source of pleasure, luxury, company or hobby. To some others like the Indian cultivators, the cattle are the capital. Rice has rightly remarked, in this connection, that domesticated animals had nourished as well as reinforced man's sinews, quickened his mind and broadened his sympathies for so many centuries past. Sociologically, therefore, animal husbandry was one of the factors of civilization in the past and continue to be so even at the present. Economically speaking, it is an untapped economic resource of India.

Unfortunately, due to poor animal husbandry practices in India, cows are poor yielders; bullocks are less efficient; a large number of cattle is unproductive, non-descript and decrepit; and considerable percentage of about 60% of the total organic manures is wasted as fuel and as a thing destitute of essential chemical ingredients. The performance of Indian cow is unsatisfactory. Average yield of milk per cow, for example, is the lowest i.e. 413 lbs., as against the highest yield of 8,000 lbs. in the Netherlands followed by 7,000 lbs. in Australia, 6,000 lbs, in Sweden and a little more than 5,000 lbs. in U.S.A. Efficiency of Indian bullocks is believed to be low and can be increased by 60% for the country as a whole, Besides, there are ten percent of our bovine population unproductive or unserviceable. Indian cattle in general are underfed and illfed.

Animal Husbandry Practices

It is, therefore, necessary to note the practices and malpractices leading to such miserable animal-husbandry condi-

tions. While considering the animal-husbandry policy, breeding, feeding and management practices should be taken into consideration as the most outstanding features of livestock-production. *The breeding*, in the villages, is defective and indiscriminate. The advent of planning in India has brought in the definite breeding policy. The all-India breeding policy has been consequently designed to increase the production of milk in the country without affecting the position in regard to the supply of bullocks required for cultivation. All the live-stock-improvement measures are being pursued, in general, through the key village scheme which provides for concentrated work in selected areas. This scheme envisages castration of scrub bulls, breeding operations controlled by artificial insemination centres (each of which is intended to serve about 5,000 cows of breeding age), rearing of calves on a subsidised basis, development of fodder resources and the marketing of animal husbandry products organised on co-operative lines"[1]. The Second plan claims to set up 1258 key villages, 245 artificial insemination centres and 254 extension centres as against 600 key villages and 150 artificial insemination centres established during the First Plan. The animal husbandry research also has been conducted at three levels, namely, national, regional and state, to serve as the basis for all these improvement measures.

Stall-feeding, in the western sense of the term, is an exception in India. Whatever kind of feeding that farmer practises is even not scientific. The farmer, in the crisis of economic difficulties and religious dogmas, causes animals to be half-dead and half-alive. "The chronic starvation on the part of the cattle accounts for, on an average, one-third of the total cattle-mortality. This starvation of the period cripples our cattle, makes the cow an irregular breeder that reduces her natural milking qualities until she is unable to suckle a healthy calf, that leads to scarcity of good bullocks, and that creates the urge which covers the village grazing grounds of India with useless and decrepit cattle"[2]. This nature of feeding and consequent results thereof, are due to the inadequacy of fodder and feed resources in India. It is estimated that the quantity of fodder available is about 78% of the requirements while the available concentrates and feeds would suffice only for about 28 percent of the cattle. As concentrates are usually given only to animals which are heavily worked either for milk or draft-purposes, it can be said that two-thirds of the cattle can be maintained in a fair condition on the existing fodder and feed resources.

Animal-feed usually consists of five groups, namely, succulents, roughages, concentrates, minerals and vitamins. The proportionate combination of all these groups, of course, conduces good health and efficiency of the animals. Importance of effects of nutrition on the fertility and efficiency has been illustrated by Halnan and Garner, and proved thereby that high level nutrition that is also balanced one, is conducive to increase the fertility in the animals. Unfortu, nately, in India, no standardised ration has been recommended authoritatively, for feeding the animals. A. K. B. Kazi-however, worked out some feeding-standards suitable for Indian conditions, on the lines of O. Kellner in 1932. But they need modification in the light of the advanced stage of science, since Halnan and Garner have recently evolved new tables of feed-standards for the British

1. P. 284, Second Five Year Plan.

2. Rural India, November, 1950—"Our Cattle Wealth" by C. Mamoria.

cows. In view of the ignorance of farmers, shortage of food-grains, increasing absence of grazing lands and defective and discriminate feeding, there is an urgency for finding out the scientific feed-rations of animals in India.

The art of animal husbandry :—is sometimes more important than its science. "Data available indeed show that while better breeding may produce an improvement of only 10 to 12 percent in milk-yield from generation to generation, better feeding and management alone can be relied on to produce an immediate increase in milk-yield of over 50 percent in ordinary milch cows".[1] Again, Rice, Andrew and Warwick observe that in a great many commercially important qualities of American livestock only 25 percent of the individual variation from the herd or the herd average is due to environment. In short, success in breeding depends three quarters on the breeder and one quarter on the animals involved"[2] Unfortunately in India, environments in which cattle are bred, are aweful and unhealthful. Housing facilities are inadequate and insanitary. Handling and training the animals are crude. Castration is injurious. Tending of horns, hair, hoofs, etc. is done haphazardly. The appearance of stray cattle, causing menace to the crops and stalks in villages, is an additional result of bad management. Thus the management practices, said to be more important, are miserably neglected by the Indian breeders.

The '*mixed-farming*' system has been now recognised as a means of solving the problems of agriculture and animal husbandry in India. The maintenance or attainment of a balanced mixed-system of farming and the maximum practicable diversification of production has been recommended at the first conference of F.A.O. at Quebec, 1945, by the Committee on Agriculture. The implementation of this policy is of paramount importance to many countries including India. Experts like Dr. Wright and Jenkins advocated this mixed-farming system as a combination that leads to prosperity. "All planning for permanent agricultural prosperity must include the establishment of a sound balance between food, fodder, fertility and cash crops on the farm. The individual cultivator must be induced to raise food for his family and feed for his livestock and in doing so, to grow a suitable proportion of crops to replace, directly or indirectly, the fertility taken from his soil. Crops must be balanced with livestock in a proportion consistent with the best land use and capability. The wider adoption of carefully planned mixed-farming systems in our rural areas is, I believe, essential to the attainment of these objectives upon the achievement of which will depend the future social and soil security of India".[1] The Second Five Year Plan of India too has recommended this system to ease the food and fodder shortage in India.

General :—Dairy Aspects—The place of Dairy-farming in a permanent system of agriculture is seen from the fact that agricultural development in all civilised nations is characterised, in succession' by such stages as grain-growing, beef production and dairy-farming. Decline in the production of grains, consequent upon the decreasing fertility of the soil gave rise to livestock production for beef-complementary to grain production. Beef production also had been gradually followed by dairy farming combined with more or less general farming. When this stage was reached, the fertility of the soil was retained or improved and a permanent form of agriculture was started. The dairy districts of Europe have gone through all these stages ; they were at one time chiefly grain producing regions, later engaged in beef production and gradually have become now the dairy centres of the world. A number of States in U. S. A. have already passed through these stages. Home activity of milk-production in the colonial days of America has been at present changed to the factory system.

There is no necessity of over emphasizing the importance of milk as a wholesome diet containing almost all vitamins and making good the defficiencies of the grains which form principal item of our

1. P. 220—Indian Farming, May 1940,
2. "Breeding Better Livestock" by Rice, Andrew & Warwick.

1. P. 613—Commerce, 12th October, 1946.

diet. Man has used dairy products as far back as history records and recent investigations have made clear the extent to which the human family has become dependent upon the cow. Lastly, dairying is a safe-business and provides a year-round job for the farmer.

Dairy cow in India serves many purposes. "Keeping and breeding of milch cattle is the most ancient of agricultural pursuits in India. Perhaps in no other country of the world are needed so vitally for the products they yield while living and which they leave behind after they die a natural death, to supplement the vegetarian dietary and other requirements of the people with milk and its products, and for supplying the huge amount of bullock power required to carry on its main occupation, viz., agriculture".[1] Notwithstanding this fact, dairy industry in India is still a cottage industry. It is undertaken to meet the needs of the farmer's family without bothering about its marketing aspect and consequently farmers are indifferent to adopt modern techniques of production and distribution. Due to some other considerations like inadequate and inconvenient transport facilities, adverse climatic conditions and lack of organization among the producers scattered here and there, dairying has been confined to the villages and has been treated as a part time occupation to the farmer.

Production :—Indian milk production is comparatively low in relation to its milch animals and their yield. For example, India produced about 4.5% of the world total milk-supply, on an average of three years (1948-52), with about 9% of the world total number of milch animals while, during the same period, U. K. contributed 4.3% of the world supply of milk with 1.2% of the world total milch animals and U.S.A. 23.5% with 3.8% and Denmark 2.1 with 0.12%. The reasons for this low contribution might be attributed to the small holding of dairy farming and poor yield of the milch animals. Each holding of dairy farming in Denmark for example, consists on an average, of about 9 cows while in U. S. A. it has 12 heads and in Great Britain and New Zealand it has 25 heads of cows. In addition to the low average milk-yield per cow and buffalow, as is mentioned previously, production of milk per village and per square mile, too is low. It is estimated that production of milk in the Indian Union works out less than $2\frac{1}{2}$ maunds per day per village and only 1 maund and 4 seers per day per square mile.

1. Report on the Marketing of Milk in India, 1950.

Utilisation :—Regarding the utilization of milk for various purposes, of the total milk-production in India, 41.84% is converted into ghee, 37.5% consumed as fluid, 9.14% as dahi, 6.19% as butter and 4.22% is used in manufacturing Khoa and 1.5% for cream and ice-cream. The largest percentage is converted into ghee because it is the only product in which surplus milk can be stored and marketed if necessary, in view of the absence of adequate transport and storage facilities and the presence of adverse climatic conditions. U. K. and U. S. A. consume liquid milk in higher percentage than any of its other form while Australia, Denmark and W. Germany use it for manufacturing butter in higher percentage.

Marketing Aspects :—Marketing problems arise only in case of the marketable milk amounting to 17% of the total milk supply in India since the remaining 83% is consumed in villages only. In the absence of organised dealing in milk and milk-products and with the presence of many intermediary processes between production and consumption of milk, middle-men are bound to play an important role in the marketing of milk. Consequently malpractices like undue price-spread, adulteration and no standard units of weights and measures, prevail therein. Extent of the price-spread can be seen in the fact that the producers get an average about two-third of the price paid by the consumers and the remaining is divided between the two functionaries, namely, the collectors and retailers. Adulteration is practised regarding both milk and ghee to make up the cheapness of them due to specific difficulties of production and distribution mentioned above. The percentage of adulterated milk-samples out of

the total examined, for example, varies from 16% in Punjab and 60% in Hyderabad upto 88% in Poona. In the case of ghee also, a survey recently conducted by the Directorate of Marketing and Inspection in 34 towns, shows that out of the total number of 84 samples of market ghee collected from all over India, 66 (66.7%) samples show adulteration with vegetable fat, 20 samples (23.8%) are of doubtful purity and 8 samples (9.5%) are found pure.[1]

Equipment & premises :—The weights and measures are also not standardised on all India basis. In many areas, local units are in practice suiting the ignorance and illiteracy of the village producers and suppliers. For example, garvi, kaccha and Pakka seers etc. are some of the units which also vary from village to cities. In Assam, as an evidence 1 seer in towns=82 tolas, while in villages 1 seer equals 120 tolas. Recently, under the Weights and Measures Act of Bombay State, the standard seer has been legally made equal to 80 tolas and this standard seer has, however, been gaining popularity all over India.

The premises of milk-marketing places and shops are unclean and indecent. Equipment is obsolete and very poor.

Legislation :—The Central and State Governments have been trying to curb the adulteration of food articles including milk and ghee. The Acts like Food Adulteration Acts and the Agricultural produce (Marketing and Grading) Act are rather honoured in their breach than in their observance. Even the Acts are not coordinated on all-India basis. The legal standards of milk-quality, for example, vary from State to State. Minimum percentage of milk-fat of cow milk in Punjab and U.P. is 3.5, while it is 3.0 in Madras and Mysore. Similarly, in case of buffalo milk, it varies from 4.5% in Mysore and Madras to 5 in M. P. and 6 in Bomby. Moreover, these standards are below the naturally present percentage of fat in respective milks. This difference gives rise to so many mischiefs on the part of sellers. Regarding the execution of the Acts, the staff of inspection and grading is inadequate and improperly recruited and supervised. Many Local Self-Governments have recruited untrained and inexperienced personnel to carry out these Acts. One more reason of the breach of these Acts is the public apathy and non-co-operation of the private traders. But in U. K. and U. S. A., Government and the private traders co-operate to maintain the standards of the quality put forth by the Legislation. The administrative machinery for this purpose is fully trained and authorised properly, consequently the percentage of adulteration there works out to be too low. In India the above Acts should be co-ordinated on an all-India basis and be provided with properly trained and authorised personnel. More important than the legislation is the public education and co-operation for which suitable propaganda should be undertaken by the Government,

Draft-power :—The relevance of this problem arises from the fact that agriculture in India is carried out mainly with the help of bullock-power (produced by the cow.) In the words of the Royal Commission on Agriculture in India: "In most parts of the world cattle are valued for food and for milk; in India their primary purpose is draught for the plough or the cart......... Without the ox no cultivation would be possible; without the ox no produce would be transported".[1] This remark is even now valid in view of the huge population of power animals numbering 672 lakhs i. e. one power animal for every 4.3 acres, and of the insignificant use of tractors numbering 8354 in 1951-52, the number of which comes, on an average, to be one for every 30,000 acres. India is very slow in adopting power-machines on the farms as against U. K., W. Germany, U. S. A. and U. S. S. R. where each tractor operates 16, 18, 43 and 100 acres respectively. Seeing that the power-mechanization in certain countries resulted in higher production, to introduce it in some other country like India where physical as well as financial conditions are entirely different, seems to call upon a danger. Unlike the Western countries, India has not favourable situations, to

1, P. 4—Agricultural Marketing in India—Studies in Ghee Series I, 1954.

1. P. 16?—Report of Royal Commission on Agriculture in India, 1928.

have an increased use of power-machines on farms, such as larger farms, high level of technical skill, adequate capital, relative shortage of labour, ample supplies of low-priced petroleum and satisfactory progress of rural electrification. Moreover, the farm equipment in India is composed of huge population of power animals and a large number of local implements which would be the national waste if the present mode of cultivation is displaced by the wholesale mechanization. Remedy should therefore be found out in such a way as to take the advantage of the existing equipment along with the introduction of certain improved mechanical appliances aiding the bullocks.

Recent tendency swings towards adopting these appliances and small and medium machineries on the farms. Such agricultural machineries excluding the tractors, are on the whole 58 millions in India i.e. one machinery for every 583 acres. The agricultural policy regarding the use of bullocks and machines on the land in India can, therefore, be advocated as following: (a) "Salvation of India lies in the restricted use of tractors. The tractors may be used with advantage for opening up new lands, ploughing old fallows and weed infested areas. Fuller use of mechanical appliances should be made for soil conservation operations and for lifting water. Follow-up cultivation by mechanical means and use of small tractors should be controlled by certain regulations. But it is very necessary that each and every tractor should have its own complement of animals behind it so as to produce its quota of organic manure and milk. Only by taking this precaution it will be possible for us to take good care of our bullocks and cows. A policy of mechanization of agriculture in India, therefore, should be accompanied by simultaneous or even fore-running policy of imparting mechanical sense and technical training to the farmers".[1] (b) Secondly, indigenous implements should be improved and new mechanical appliances should be designed to fit in these local implements and other conditions. Mechanization is not necessarily the Panacea of all power and labour problems on the land. When there is an abundance of draft animals and labour is not lacking much good can be done by improving indigenous implements, and often by introducing foreign ones, provided that improvements and new tools are within the capabilites of cultivators to handle".[2] (c) Lastly, despite the rapid increase in the number of tractors in use in the world of agriculture, since the early part of this century, more than 85% of the total draft-power used in forming operations is still provided by the work-animals.[3] This fact indicates that the tractor has its own possibilities but it cannot replace the animal power. India also is not an exception to this.

Economy of power animals in India :— Allowing for the role of bullocks in Indian agriculture, let us see whether they are surplus or deficit in relation to the requirements of the land. The Royal Commission on Agriculture estimates that a pair of bullocks can productively cultivate, on an average, 10 acres of cultivated land. According to this estimation, 48 million bullocks are required to operate 240 million acres cultivated land of dry-farming. Assuming that a pair of bullocks can cultivate the irrigated land of 5 acres, about 20 million power animals are needed on 51 million acres of irrigated land. Thus the present total population of the power-animals in India comes about 67 million heads which are more or less equal to the required draft-power by the cultivated land. But regarding the efficiency of the existing bullocks, it should be increased by 60% all over India which would meet the increasing demand to be created by the mixed-farming system and intensive cultivation consequent upon the expanding irrigational facilities.

Marketing of cattle:—Marketing of Cattle in India is significant due to the heavy density of cattle and the varied uses of them in the economy as mentioned before. The density of bovine

1. P, 95—"Proceedings of the Nineth Meeting of Agriculture and Animal Husbandry Wing of India, 1951",

2. P. 32—"Considerations and Processes of Successful Introduction of Farm Mechanization, 1954"—F.A.O.

3. Table on page 3—"Progress and Economic Problems in Farm-Mechanization, 1950"—F.A.O.

population for every two persons, is one. Even then, cattle-markets are unorganised and are conducted as inevitable evils of the agricultural economy of India. They are not regulated, excepting a very negligible number i. e. three, all over India. The working of these three regulated markets indicates that there is a wider scope for regulating all the cattle-markets in India. Regulation of these three markets is found to have avoided undue middle men's charges, sale of stolen animals and most of the malpractices such as intoxicating the animals, feeding unhealthy shrubs etc. It ensures adequate water supply and sanitary conditions, also, for animals. As the regulated markets try to estimate the malpractices, the buyers and sellers now get in those markets, to the tune of 15 to 20 percent of the amount which usually used to go into the pockets of middlemen.

Movement of Cattle:—

Since the cattle have to move from the surplus areas to the deficit ones and from the areas of low-prices to those of high prices, in accordance with the consequences of price-mechanism, they should be provided with transport and communication facilities. The existing railway facilities suffer from inadequacy of light, ventilation and space. The procedure of booking and despatch of animals seems many times inconvenient for the traders. Moreover, no cattle-sheds are constructed even at the important railway stations for resting the animals. As an alternative, cattle dealers resort to the roads. No private-truck or other such road conveyance carry the animals. But animals themselves have to march on the roads. 80% of the total marketable cattle in India move on roads. Road marching is favoured as the cost involved is low, and generally there is an advantage of free-grazing and marketing of cattle enroute. But the effects of long distance moving, for days together, of many animals cause exhaustion of energy and deterioration of quality resulting in fetching very low-prices.

Market Information :—

Buyers and sellers have to be kept informed of the current price-structure and prevailing marketing conditions of supply and demand, so as to ensure them with fair and secure dealings. Unlike the Western countries, there is no Market Information Bureau regarding animals. The Directorate of Marketing and Inspection had, however, organised Cattle News Service in 1938 on an experimental basis, but was discontinued in 1945 due to ban on cattle for export from pre-partitioned Punjab. Such service should be again started in view of the importance of animals in the economy and thereby protect the cattle dealers from malpractices. Wide publicity and propaganda would also serve the purpose.

Utilization of Bye-Products of Slaughtered as will as of naturally Dead Animals :—

The animals, even after their death, serve the man-kind in the form of the byproducts such as meat, hides, bones, blood, gut etc. Meat happens to be the nutritive diet while hides are used for leather goods like shoes, mohotes, ropes etc. Bones, blood and other offals are useful in manufacturing manures, and feeds for poultry and pigs. The medicinal uses of other glands have been recently recognised and are increasingly used to strengthen the life of diseased persons. Insulin, liverextract, pepsin, adrelin, for example, are the drugs to cure the persons suffering from diabetes and anaemia. Bristles make brushes and heir makes upholstry paddlings. Fats and lanolin are the base of many cosmetics, creams etc. The lard has other uses than to cook with. It is used for illumination as lubricant and for manufacturing chewing gums, candles, etc.

There is the possibility of running subsidiary industries of these by-products resultant of slaughtering and natural death of animals. In America every slaughter house has the provision of utilising them in a profitable way. But in India, no attention has been given to conserving and utilizing of such by-products. In a very few slaughter houses like Jullander, blood and guts are collected and utilised for commercial purposes. The by-products of the naturally dead animals also are wasted. Regarding the use of by-products of

dead animals, the Board of Economic Enquiry, Punjab conducted a Survey in 1954-55 in Punjab and found out the following conclusions which are more or less equally prevalent in almost all the States of India. They are: (1) Nearly 30% of the dead animals are not flayed at all but left to vultures or buried. (2) The methods of removal (flaying) and tanning are crude resulting in low quality of hides. (3) Parts of the animals flayed are not fully and properly utilised. (4) Processing of such parts, if to some extent, is limited and partial. (5) A perusal of price-spreads between the primary producers and the final consumers shows that there is a large-scale exploitation of the former by the intermediaries.

Hides :—Trade in Indian hides has the the future prospects in the foreign markets. The annual value of total Indian exports has been reckoned at Rs. 13/- crores as against Rs. 6/- crores of pre-partitioned India. India will have more exports and thereby gain more foreign exchange if the tanning industry and flaying process are organised and encouraged on scientific lines. This can be achieved because (1) In India, the annual production, including the fallen hides, represents only 10.4% of the total number of the country's cattle, which may be raised in case all useless animals are slaughtered; and all the neturally dead animals are flayed; (2) The exports of tanned and dressed hides of India are encouraged due to the following reasons. The reasons are: (a) (a) Indian tanned and dressed hides can easily be finished; (b) import charges are less due to reduction in weight, (c) as tanning is being done on a cottage-Industry scale, the importing countries derive a direct benefit from the cheap labour and tanning material used for manufacture of this leather; and (d) the export of dressed and unwrought leather is also advantageous to India as it brings more money into the country than the raw hides, besides giving employment to a very large number of our countrymen.

India is one of the largest producers of marketable raw hides in the world amounting to 190 lakh pieces which forms 15% of the total world-production. Of the total production, only 20 percent use to be exported and 80 percent are consumed by small and large tanneries for preparing leather suitable for different types of articles used in the country. And 11.62 lakh raw hides are annually imported and more than 50% of this comes from Pakistan followed by U. K. and U. S. A.

The tanning industry in India is defective and backward. Equipment of flaying and tanning are crude and the persons engaged in this are unskilled. The saline supply is inadequate and if any, it is untimely. Consequently, Indian hides suffer from scraps and ticks and the fallen hides bring less price than the slaughtered. The storing godowns are almost absent and grading is not scientific. The private traders do not co-operate with the directions of the Directorate of Marketing and Inspection. It is, therefore, necessary that tanning industry should be modernised. Peripetetic demonstration parties to educate the rural tanners and flayers, Government hides curing centres, research institute for standardising the methods of processing and finding out new saline deposits, adequate storing and warehousing facilities, and co-operative societies among the rual producers and collectors, should be provided to foster the industry.

Meat:—The importance of meat cannot be over-emphasized in the presence of nutritively deficient Indian diet. But meat-production in India is an infant industry. It is carried on a very small scale and scattered holdings, due to illiteracy, ignorance and considerable indifference from a large proportion of Hindus. As against other countries, cattle in India are neither bred for slaughter, nor are they killed in any appreciable numbers for the supply of beef. For instance, in Italy the number of cattle slaughtered annually represents 44.6 percent of the cattle of the country; in the U. S. A. and U. S. S. R. the proportions are 44.4 and 43.7 percent respectively. In India, on the other hand, the annual production of beef represents only 0.9 percent of the total number of country's cattle.

The per capita meat consumption in India is also low. It comes to 3.4 lb. per

year as against 282 lbs. in Uruguay, 266 lb. in Argentina, 244 lb. in Australia and New Zealand, and 154 lb. in U. S. A. The per capita consumption of meat is very low because of abject poverty of the masses, which does not provide any means of purchasing power, and of low meat-yield per animal. Special attention should, therefore, be given to better breeds, better methods of feeding, better control and more intensive action against animal diseases, rationalization of animal feeding, amalgamation of scattered holdings together with development of better feed-supply and better use of grass lands and pastures.

Meat being a highly perishable article of food must be consumed fresh. It can only be stored for a short time through proper processing and storage. In India, cold storage, long distance transport, speedy assembling and large-scale production being underdeveloped, consumption of meat is mainly confined to the area of its production. For example, 90% of the meat produced is consumed in the area of production and only 10% enters into the market. Premises and equipment of meat production and marketing are unhygienic. No grading and quality inspection of meat is practised in almost all markets. Observing the hygienic conditions of meat industry in India, the Report on the Marketing of Meat in India 1956, remarks as following: "The rapid development of meat industry depends on a series of innovations as the establishment of Central Slaughter houses, rigid meat inspection, use of suitable modern types of equipment on a large scale for working various sections in abottoirs, the provision of ice and cold storage facilities in the slaughter houses and meat markets for preservation, storage and distribution of supplies, the provision of improved or insulated meat vans, the improvement in storage conditions at wholesale and retail markets, the inspection and grading of meat and products and utilization of supplies by uptodate methods and of wastes and edible offals by the development of by-products industries".[1] For this, the Central Slaughter Houses Committee, comprising of official and non-official experts on this problem, should be appointed by the Government to frame the rules and regulations for construction of slaughter houses, upkeep of meat-markets, provision of skilled tanners and flayers, quality control and research schemes etc. Butchers should be organised on co-operative basis and their inertia should be turned to enthusiasm and their complacence to endeavour.

1, P. Report on the Marketing of Meat in India, 1956.

Cattle Insurance :—

The poor animal husbandry practices in India are accountable for the inadequacy of veterinary facilities also. It is agreed that animals are lacking in resistance against diseases on account of defective breeding, feeding and management. Epidemics, therefore, take a huge toll and numerous deaths of them. The total annual loss to the country through epizootics has been estimated at Rs. 3 crores. Moreover, indirect effects of the contagious diseases are dangerous. For example, "Rinderpest is not so deadly when it attacks the ordinary cattle of the plains, but though the average mortality which fluctuates widely, may not be more than 30% of those affected, the remaining 70% are enfeebled by disease. Similarly in case of foot and mouth disease, for every animal that dies 99 may be temporarily incapacitated."[1]

In addition to the absence of adequate Government's provision for veterinary facilities, there are no private practitioners unlike the Western countries, to attend the diseased animals. Consequently, the weak will die and the strong will survive. Thus the farmer sees to the mercy of the nature rather than to the help of Government or other agency. Even though some veterinary facilities are provided by the Government, the breeders would not take the advantage of them. This is due to their inertia and superstition. Since the animal life is uncertain and not guaranteed for its long period productiviety, private enterpreneurs also do not invest on the cattle.

1. P. 2....Problem of Cattle Insurance under Indian Conditions, 1950.

Government should, therefore, expand the existing veterinary facilities through increased staff and dispensaries. Disease control measures should also be undertaken. These measures can well be supplemented by launching upon the cattle insurance scheme all over India. Interest in breeding the animals can be inculcated into the mind of farmers by insuring economically important animals against specific contagious diseases. The necessity of cattle insurance arises from the fact that cattle serve as the capital to the farmer and unexpected deaths of them result in heavy loss rendering him indebted and sacked of every incentive of breeding animals.

Cattle insurance reduces the incidence of deaths and diseases; encourages dairy and breeding industries; smoothens agricultural activities; and improves the animal husbandry practices. Government of India is, therefore, thinking to launch a research pilot scheme of cattle-insurance on all-India basis. This pilot-scheme has been prepared in accordance with the recommendations made by the "Crop and Cattle Insurance Conference" held in Bombay in 1949. The scheme envisages to introduce cattle insurance centres in representative breeding tracts. Each centre shall insure 1000 to 2000 animals and serve as the training centre for the new staff and as the place of educating the public. It includes both the Term—Insurance and the Endowment Assurance Policy. The scheme shall be executed through co-operative cattle insurance societies with Government supervision and help. The establishment expenditure and secretarial expenses of the societies are borne in the beginning by the Government to help them build the reserves for unexpected emergencies. The Central agency shall act as a co-ordinating and reinsuring institute. The increased staff shall be provided to aid the working of the scheme. Certain rules and procedures have been laid down for the entry and exit of the policy. The scheme is contended with available data at Government Dairy farms and through sample enquiries in the areas of operation. This is an experimental measure to pave the smooth way for the Co-operative Cattle Insurance Societies to be self-reliant in due course.

Income and Employment Potential :—

Dr. Wright estimated, as early as 1937, the actual value of produce derived from cattle and the potential value of cattle to Indian agriculture as following: "In actual value (including the value of dairy products) the industry contributes at a very rough estimate about 1000 crores of rupees to the agricultural income of the country which has been assessed at a total of 2000 crores of rupees. The potential value of cattle as a means of raising the level of fertility of the soil and of thus increasing the output of both cash and fodder crops is, I believe, incalculable".[1] Recently, the First Five Year Plan estimated the total income derived from the bovine population of India to be Rs. 1000 crores, excluding the labour value of the bullocks. In other words, animal husbandry contributes 10% of the total national income. Regarding the potential value of the animal husbandry in India, in terms of soil-fertility and the physical welfare of the people, the role of the animal husbandry is of paramount significance particularly in the days of food shortage, low-labour efficiency and short expectancy of life.

Employment :—

Since the agriculture in India is bracketed with animal husbandry, a large proportion of the agricultural population is directly or indirectly connected with the animal husbandry. In addition to the millions of persons required by the millions of pairs of bullocks to carry out agricultural operations, cowherds, butchers and cattle traders of whom no accurate statistics are available, there are 193 lakh rural milk-producers and 2 lakh urban milk producers. There are, again found several groups of persons engaged in assembling, handling and distribution of milk. Considering the average quantity handled per day by collectors, halwais, dairies, etc. and the number of employees that some of them keep, it is estimated that for every maund of milk about two men are

1. P, 61-Report on the Development of the Cattle and Dairy Industries of India, 1937, by Dr. Wright.

engaged for rendering the above services. On this basis, for handling about 900 lakh maunds of milk per annum, approximately five lakh persons are employed to render the various services between the producers and consumers.[1] According to the Census of India 1951, of the total self-supporting persons in all industries and services, more than 15 lakh (i.e. 3%) persons are engaged in almost all branches of animal husbandry. This figure equals to the half of the total industrial labourers in India, and therefore, calls for careful attention from both the Government and the public. Animal husbandry, therefore, would ease the unemployment problem to a considerable extent if it is modernised on scientific lines and is made a commercial business. As an evidence, the Second Plan has envisaged to produce 5,000 veterinary graduates to carry out the livestock improvement measures by the end of that plan period. For this, four new Veterinary Colleges have been set up and a second shift introduced in five existing Colleges, It is also proposed to establish a dairy science College. Besides, so many short-term courses have been started by the State Governments to train for the subordinate staff. Stock-men's courses, dairy training classes etc. are some of the short term courses.

Recent Developments :—

In order to improve the lot of helpless animals and thereby to meet the present requirements of milk and others, the Government of India with the help of the State Governments has taken so many measures which, of course, fall short of coping up with the extensive and intensive problems of huge cattle population of the vast country. So many Committees were appointed and Enquiries were condused to investigate and suggest the measures of development of the animal husbandry and the recent developments are consequent upon some of the recommendations of all of them. These developments are characterised by, broadly, urban milk-supply schemes, reorganisation of goshalas and panjrapoles, key village system, passage of Livestock Improvement Acts and Disease Control Acts, Co-operative Dairy Societies and Government as well as Co-operative Cattle Breeding Farms, establishment of educational institutions including research etc. For all these improvements of animal husbandry and dairying, the Second Plan has sanctioned Rs. 56 crores as against Rs. 22 crores of the First Plan. In other words, 1/80th of the total outlay of the Second Plan is to be spent on the amelioration of the animal husbandry and dairying which in turn contributes at present, 1/10th of the total national income of India.

Integrated Policy for the Improvement of Animal Husbandry in India :—

The policy of Animal-husbandry should comprise the following:—

(a) 'Mixed-farming' system should be popularised.

(b) The efficiency of the milch and power animals should be increased by the improved method of breeding, feeding and management.

(c) To have the better-breeds, the superior-germ-plasm should be multiplied by means of artificial insemination, and selection method where key village scheme is not in operation.

(d) All the present Food Adulteration Acts of different States should be co-ordinated and modified on all-India basis.

(e) The modified Food Adulteration Act, and the Agricultural Produce (Marketing and Trading) Act should be strictly applied with more qualified staff. The private traders should co-operate to make these Acts successful.

(f) Cattle-markets should be regulated and adequate transport and storing facilities should be provided.

(g) The Livestock Improvement Act and Disease Control Act should be implemented, strictly, in areas which the key village scheme does not touch.

(h) Cattle-Insurance Scheme shall be introduced.

(i) The model rules for meat inspection and for inspection of slaughter houses and their regulation, prepared by the I. L. A. R. should be enforced in case of the existing slaughter houses and other marketing places and of more to be newly established.

(j) Publicity and propaganda shouldbe augmented to obtain public co-operation.

(k) All India Research Institute of Animal Husbandry subjects should be set up to standardize the results on all-India basis.

(l) More milk-supply schemes in other cities than the present covered and more rural creameries and dry plants should be established.

(m) Indigenous implements should be improved to aid the bullocks and medium mechanical appliances should be designed to suit the local conditions.

(n) The existing panjrapoles and goshalas should be reorganised with Government help and supervision.

(o) An indiscriminate ban should be imposed on the slaughtering of useful

1. P. 93 Report on the Marketing of Milk in

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